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County Of Santa Cruz

MICHAEL BEATON
DIRECTOR

GENERAL SERVICES DEPARTMENT
GENERAL AND EMERGENCY SERVICES
701 OCEAN STREET, SUITE 330, SANTA CRUZ, CA 95060-4073
(831) 454-2210 FAX: (831) 454-2710 TDD/TTY: 711

ADDENDUM # 2

90 ROUNTREE BOILERS AND DOMESTIC HOT WATER REPLACEMENTS PHASE 1 & 2 AND PROJECT# 22TI-049

Issued 04/05/2024

This addendum *(2)* is being issued in response to general inquiries and to provide clarification and corrections to the Construction Documents for the above project. These changes are hereby made a part of the Construction Documents to the same extent as though it were originally included therein.

Clarification/Correction:

Question:	**Answer:**
1. Due to the size of the AERCO Units the boilers will need to be moved through the double doors and the height will be tight. What is the height of the units?	The units are 78" high, the boiler room double door entrance is 84" high.
2. There is a discrepancy between Exhibit A (boiler replacement) and Exhibit B (WH replacement) plans with regards to the circuit numbers assigned to DWHP-1 and 2, HXWH-1 and 2, HXP-1. Please confirm correct circuit numbers for each piece of equipment.	SHEET E3.1- POWER PLAN has been updated to reflect the changes for both phases 1 & 2 are clouded with a delta 2. Revised Plans are attached to this addendum. Note that there are NO updates to the mechanical plans.

Engineer's Estimate: The engineer's estimate remains the same at $500,000.
Bid Submittal: The bid submittal deadline remains unchanged, Thursday, April 11,2024.
Bids are due at 2:30 PM, April 11, 2024.

PLEASE NOTE: Acknowledgment of receipt of this addendum is required on the bid schedule, page 2 of your bid packet.

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Please call Kristine Conley, Project Manager with any questions regarding these specification changes at (831) 454-4864.

Addendum #2 authorization:

DocuSigned by:
Michael Beaton
4A18A3818BC8457...

Michael Beaton - Director

4/5/2024

Date

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WWW.AXIOMENGINEERS.COM

SANTA CRUZ COUNTY – ROUNTREE FACILITY

BOILERS & DHW REPLACEMENT – PHASE 2

90 ROUNTREE LANE
WATSONVILLE, CA. 95073

INDEX OF DRAWINGS

DWT. NO.	SHEET TITLE
T0.1	TITLE SHEET
M0.1	LEGEND, SCHEDULES, SPECIFICATIONS AND NOTES - MECHANICAL
M1.0	MECHANICAL ROOF PLAN - NEW & DEMOLITION
M1.1	MECHANICAL FLOOR PLAN - DEMOLITION
M1.2	MECHANICAL FLOOR PLAN - NEW
M4.1	MECHANICAL PIPING & CONTROLS DIAGRAMS
E0.1	ELECTRICAL - SYMBOLS, ABBREVIATIONS, CODES, STANDARDS & NOTES
E1.1	ELECTRICAL SINGLE LINE DIAGRAM & PANELBOARD SCHEDULES
E2.1	OVERALL SITE PLAN
E3.1	ELECTRICAL DEMOLITION & POWER PLAN
E4.1	ELECTRICAL SPECIFICATIONS

SCOPE

THIS PROJECT IS THE LIMITED TO REPLACEMENT & IMPROVEMENTS FOR: TWO (2) HEATING HOT WATER BOILERS & PUMPS & ASSOCIATED DELTA CENTRAL BUILDING MANAGEMENT CONTROLS INTERCONNECTION & PROGRAMMING.

NEW REQUIP SHALL BE PROVIDED BY INSTALLER. PUMPS & HEAT EXCHANGER ARE FURNISHED BY OWNER & SHALL BE RELOCATED FROM: BEBO PALE INE FACILITY BY INSTALLER. COORDINATE WITH OWNER REPRESENTATIVE FOR ACCESS & TRANSPORT OF EQUIPMENT.

CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERATIONAL BOILER & PUMPS SYSTEM AND ALL REQUIRED ELECTRICAL WORK, CONTROL OF NEW EQUIPMENT SHALL BE PER SPECIFIED CONTROLS.

PROJECT INFORMATION

PROJECT: ROUNTREE FACILITY
ROOFTOP UNIT REPLACEMENT

LOCATION: 90 ROUNTREE LANE
WATSONVILLE, CA. 95073

LIST OF GOVERNING CODES:

2022 BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24, C.C.R.
2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, C.C.R.
2022 CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24, C.C.R.
2022 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, C.C.R.
2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, C.C.R.
2022 CALIFORNIA ENERGY CODE, PART 6, TITLE 24, C.C.R.
2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, C.C.R.
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24, C.C.R.
2022 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24, C.C.R.
TITLE 19, C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

ALL SECTION NUMBERS BELOW REFER TO GROUP 1, CHAPTER 4, PART 1, TITLE 24, C.C.R.

1. ADDENDA, CONSTRUCTION CHANGES PER SECTION 4-338.
2. INSPECTION APPROVED BY DSA. INSPECTOR AND DSA STANDARDS INSPECTION OF WORK PER SECTIONS 4-333 AND 4-334.
3. TESTS AND TESTING LABORATORY PER SECTION 4-335.
4. SPECIAL INSPECTION PER SECTION 4-334(c).
5. CONTRACTOR SHALL SUBMIT VERIFIED REPORTS PER SECTION 4-336 AND 4-338(c).
6. ADMINISTRATION OF CONSTRUCTION PER PART 1, TITLE 24, C.C.R. - DUTIES OF ARCHITECT, STRUCTURAL ENGINEER OR PROFESSIONAL ENGINEER PER SECTION 4-333(a) AND 4-341.
7. GOVERNING CODES, TITLE 24.
8. PARTS 1, 2, 3, 4, 5, 6, 9, 11, 12 AND 5 OF TITLE 24 SHALL BE KEPT AVAILABLE IN THE FIELD DURING CONSTRUCTION.
9. DSA SHALL BE NOTIFIED OF START OF CONSTRUCTION PER SECTION 4-183.
10. SUPERVISION BY THE DIVISION OF THE STATE ARCHITECT PER SECTION 4-184.

PROJECT DIRECTORY

MECHANICAL ENGINEER

AXIOM ENGINEERS, INC.
4605 WEST WALNUT ST, SUITE 1
SQUELL, CA 95073
CONTACT: SEAN KING P.E.
PHONE: (831) 464-4208
FAX: (831) 464-4323
E-MAIL: sean@axiomengineers.com

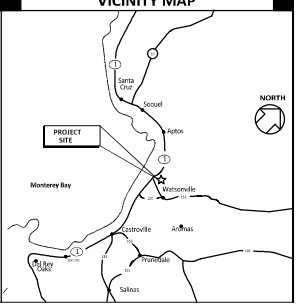
ELECTRICAL ENGINEER

ALMANZ CONSULTING ENGINEERS
1000 FOREST AVE, STE 10
MONTEREY CA 93940
PHONE: (831) 646-3350
CONTACT: ELDRIDGE BELL

REQUISITE OWNER COORDINATION

1. COORDINATE ALL SYSTEM (HEATING, CONTROLS, POWER, ETC.) SHUTDOWNS WITH COUNTY/OWNER REPRESENTATIVES. PROVIDE ALL SHUTDOWN REQUESTS AT LEAST TEN (10) DAYS PRIOR TO SHUTDOWN.
2. CONTRACTOR SHALL COMPLY WITH ALL FACILITY SECURE ACCESS REQUIREMENTS WHILE ON SITE.

VICINITY MAP



REVISION	DATE
PC DRAWINGS	06/05/2023

REGISTERED PROFESSIONAL ENGINEER
No. M33543
Exp. SEPT. 30, 2024
MECHANICAL
STATE OF CALIFORNIA

COLLIGAN INTERVENTIONS

AXIOM ENGINEERS

BENCI | CORNALES | MUDFORD
MONTEREY | SAMPA | SANTA CRUZ
CBE NO. 0002018

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

TITLE SHEET

DATE	6/10/2021
DRAWN	MDYLE
DESIGN	CREO
JOB #	20210159
SHEET	T0.1

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PUMPS

MARK	GPM	TDH FT	BHP	VOLTS	PHASE	WT. LBS	MAKE & MODEL	REMARKS
(R) BP-1	150	27	-	1725	3	440/3	-	TACO 1610-5	1 2
(R) BP-2	150	27	-	1725	3	440/3	-	TACO 1610-5	1 2
(R) HWP-1	200	67	-	1750	7.5	440/3	314	TACO C5009	1 2 3 4 5
(R) HWP-2	200	67	-	1750	7.5	440/3	314	TACO C5009	1 2 3 4 5

1. CONSTANT SPEED PUMP.
2. CONTRACTOR IS RESPONSIBLE FOR DISASSEMBLY & TRANSPORT OF UNIT FROM 1080 EMELINE FACILITY IN SANTA CRUZ. REASSEMBLE UNIT AT PROJECT SITE AS INDICATED ON PLANS. SEE PLANS FOR BOILER PIPING. INSTALL ALL PIPING, FLUES, & ELECTRICAL POWER IN ACCORDANCE WITH MFR. RECOMMENDATIONS.
3. VARIABLE SPEED DRIVE. SEE HOT WATER PUMP DRIVE SCHEDULE. SET PUMP TO CONSTANT SPEED OPERATION DURING BALANCING SERVICES TO MEET DESIGN FLOW PERFORMANCE.
4. SEE SYMBOLS FOR INSTALLATION REQUIREMENTS.
5. PUMP & DRIVE SHALL BE CONNECTED TO EXISTING DELTA BMS CONTROLS & RE-PROVIDE WITH ALL WIRING, ACCESSORIES, & PROGRAMMING NECESSARY FOR A FULLY INTEGRATED & OPERATIONAL PUMP SYSTEM.

HOT WATER PUMP DRIVE

MARK	VOLTS	MAKE & MODEL	REMARKS
(R) HWPD-1	440/3	EMERSON SALMIK	1
(R) HWPD-2	440/3	EMERSON SALMIK	1

1. CONTRACTOR IS RESPONSIBLE FOR DISASSEMBLY & TRANSPORT OF UNIT FROM 1080 EMELINE FACILITY IN SANTA CRUZ. REASSEMBLE UNIT AT PROJECT SITE AS INDICATED ON PLANS. SEE PLANS FOR BOILER PIPING. INSTALL ALL ELECTRICAL POWER IN ACCORDANCE WITH MFR. RECOMMENDATIONS.

BOILER WATER TO WATER HEAT EXCHANGERS

MARK	LOCATION	DIMENSIONS L x W x H	PRIMARY (CHILLED WATER) FLOW RATE	PRIMARY (CHILLED WATER) PRES. DROP	PRIMARY (CHILLED WATER) INLET TEMP	PRIMARY (CHILLED WATER) OUTLET TEMP	SECONDARY (HOT WATER) FLOW RATE	SECONDARY (HOT WATER) PRES. DROP	SECONDARY (HOT WATER) INLET TEMP	SECONDARY (HOT WATER) OUTLET TEMP	HEAT EXCHANGED	HEAT EXP. AREA	OPERATING WEIGHT (LBS)	MAKE & MODEL	REMARKS
(R) BHX-1	BOILER ROOM	50"x18"x50"	150 GPM	6.1 FT. W.C.	175 °F	165 °F	59 GPM	2.1 FT. W.C.	140 °F	185 °F	778 MBH	-	743	S-1000/BHT-1000-SS-HT-12	1 2
			100 GPM	11.3 FT. W.C.	175 °F	158 °F	260 GPM	8.2 FT. W.C.	140 °F	185 °F	1,190 MBH				

1. CONTRACTOR IS RESPONSIBLE FOR DISASSEMBLY & TRANSPORT OF UNIT FROM 1080 EMELINE FACILITY IN SANTA CRUZ. REASSEMBLE UNIT AT PROJECT SITE AS INDICATED ON PLANS. SEE PLANS FOR BOILER PIPING. INSTALL ALL PIPING, FLUES, & ELECTRICAL POWER IN ACCORDANCE WITH MFR. RECOMMENDATIONS.
2. SEE SYMBOLS FOR MOUNTING REQUIREMENTS.

GAS FIRED BOILERS

MARK	LOCATION	HEATING MBH INPUT	HEATING MBH OUTPUT	MIN / MAX FLOW (GPM)	PRES. DROP FT / PS/PSI	WATER CONN.	GAS CONN.	VENT	AIR DRAW/EXT INLET CONN.	AFUE	MAKE & MODEL	WT. (LBS)	REMARKS
B-1	BOILER ROOM	200/1,000	2,880	25/350	6.97 / 218 G/M	4"	2"	440/3	8"	94.6%	AERCO BMP-3000	2,700	1 2 3
B-2	BOILER ROOM	200/1,000	2,880	25/350	6.97 / 218 G/M	4"	2"	440/3	8"	94.6%	AERCO BMP-3000	2,700	1 2 3

1. CONTRACTOR PROVIDES BOILER WITH BACnet CONTROLS COMPATIBILITY. PROVIDE WITH AERCO KNOX BUILT IN BOILER SEQUENCING CONTROLS & INTEGRATE INTO BUILDING DELTA BMS. SET UP BACnet FOR MOUNTING REQUIREMENTS. SEE PLANS FOR BOILER PIPING. INSTALL ALL PIPING, FLUES, & ELECTRICAL POWER IN ACCORDANCE WITH MFR. RECOMMENDATIONS. SEE SYMBOLS FOR FLUE THRU ROOF REQUIREMENTS.
2. BOILER SHALL BE CONNECTED TO EXISTING DELTA BMS CONTROLS & BE PROVIDED WITH ALL WIRING, ACCESSORIES, & PROGRAMMING NECESSARY FOR A FULLY INTEGRATED & OPERATIONAL HEATING SYSTEM. SEE CONTROLS SEQUENCE ON SHEET M0.1.
3. FLUSH ENTIRE CHEMICAL HOT WATER SYSTEM USING REMOVITT BOILER CONVERSIONS KIT. PRESSURE TEST TO 50 PSIG & PROVIDE COMPLETE CLEANING & CHEMICAL TREAMENT OF HOT WATER CLOSED LOOP - PERMOFIX OR EQUAL. PROVIDE INDEPENDENT 3RD PARTY WATER QUALITY TESTING FOR ENGINEER'S REVIEW TO CONFIRM WATER QUALITY IS WITHIN BOILER MFR. REPORT SHALL DECRIBE VARIOUS CHEMISTRY FOR CLOSED LOOP ACIDITY, CONDUCTIVITY, CHLORIDE, IRON, COPPER, SODIUM, HARDNESS, ETC.

ROOFTOP HEATING UNITS

MARK	AIR SIDE CFM	AIR SIDE OSA CFM	AIR SIDE ESP	WATER SIDE GPM	WATER SIDE ENT °F	WATER SIDE LVT °F	COIL SIDE MBH TOTAL	COIL SIDE MBH SENS.	COIL SIDE EWT °F	COIL SIDE LWT °F	REMARKS
(E) RTU-1	5,800	28	.81	21.7	188	130.0	3.7 FT	30"	56°	2	1 2
(E) RTU-2	5,800	28	.81	21.7	188	130.0	3.7 FT	30"	56°	2	1 2
(E) HV-3	-	-	-	-	-	-	-	-	-	-	1 2
(E) HV-4	-	-	-	-	-	-	-	-	-	-	1 2
(E) HV-5	-	-	-	-	-	-	-	-	-	-	1 2
(E) HV-6	-	-	-	-	-	-	-	-	-	-	1 2
(E) HV-7	-	-	-	-	-	-	-	-	-	-	1 2

1. PERFORM PRE-BALANCE SERVICES PRIOR TO STARTING WORK AND PROVIDE EXISTING HOT WATER FLOW MEASUREMENTS TO ENSURE THE PROPOSED CHANGES WILL NOT REDUCE HOT WATER FLOW TO NEW VALVES. PRE-BALANCE & FINAL BALANCE REPORT SHALL PROVIDE HOT WATER FLOW MEASUREMENTS FOR THE FOLLOWING: TOTAL BOILER PLANT PRIMARY & SECONDARY SYSTEM, RTU-1, RTU-2, HV-3, HV-4, HV-5, HV-6, & HV-7.
2. PERFORM FINAL BALANCE SERVICES AT PROJECT CLOSE OUT USING HOT WATER FLOW MEASUREMENTS TO ENSURE THE PROPOSED CHANGES WILL NOT REDUCE HOT WATER FLOW TO NEW VALVES. PRE-BALANCE & FINAL BALANCE REPORT SHALL PROVIDE HOT WATER FLOW MEASUREMENTS FOR THE FOLLOWING: TOTAL BOILER PLANT PRIMARY & SECONDARY SYSTEM, RTU-1, RTU-2, HV-3, HV-4, HV-5, HV-6, & HV-7.

PLUMBING & HVAC LEGEND

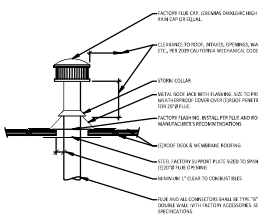
SYMBOL	ABBRV.	Iidentification	ABBRV.	IDENTIFICATION
	AIR DUCT	DWGS	DRAWINGS
	CW	COLD WATER (DOMESTIC)	EXT	EXISTING
	DHW	DOMESTIC HOT WATER	ESP	EXTERNAL STATIC PRESSURE
	DHWR	DOMESTIC HOT WATER RETURN	FLG	FLANGED
	HWS	(HEATING) HOT WATER SUPPLY	FT	FEET
	HWR	(HEATING) HOT WATER RETURN	GPM	GALLONS PER MINUTE
	ELL	ELBOW DOWN	HP	HORSEPOWER
	TEE	TEE DOWN	IN	INCH
	TEE	TEE UP	LBS	POUNDS
	CAP		MAX	MAXIMUM
	CONT	CONTINUATION	MBH	1000 BTU PER HOUR
		BALL VALVE	MECH	MECHANICAL
		PUMP (PLAN VIEW OR DIAGRAM)	MFR	MANUFACTURER
			MIN	MINIMUM
	RPZD	REDUCED PRESSURE BACKFLOW PREVENTER	(N)	NEW
			NC	NORMALLY CLOSED
	SOV	SHUT-OFF VALVE (SWITCH)	NO	NORMALLY OPEN
	T&P RV	TEMPERATURE AND PRESSURE RELIEF VALVE	OA	OUTSIDE AIR
			OBD	OPPOSED BLADE DAMPER
	TDV	TRIPLE DUTY VALVE	OC	ON CENTER
			OD	OUTSIDE DIAMETER
		STRAINER	PC	PLUMBING CONTRACTOR
	P.O.C.	POINT OF CONNECTION	PD	PRESSURE DROP
	°F	DEGREES FAHRENHEIT	PH	PHASE
	FT	FEET	PSI	POUNDS PER SQUARE INCH
	PS	FLOOR SINK	(R)	RELOCATED (FROM 1080 EMELINE FACILITY)
	AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	REQ'S	REQUIREMENTS
	ARCH	ARCHITECT/ARCHITECTURAL	RN	ROOM
	BLDG	BUILDING	RPM	REVOLUTIONS PER MINUTE
	BTUH	BRITISH THERMAL UNITS PER HOUR	SQ	SQUARE
	CLG	CEILING	STL	STAINLESS STEEL
	CONN	CONNECTION	TEMP	TEMPERATURE
	CONT	CONTINUED, CONTINUATION	TDH	TOTAL DYNAMIC HEAD
	COORD	COORDINATE	TYP	TYPICAL
	CU	COPPER	V	VOLT
	D/I	DEMOLISH/DEMO	W/	WITH
	DN	DOWN	W/	WEIGHT

MECHANICAL AND PLUMBING SPECIFICATIONS

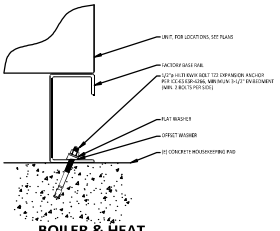
1. SCOPE: REPLACEMENT OF SINGLE STANDARD EFFICIENCY BOILER WITH HIGH EFFICIENCY BOILER INCLUDING ALL PIPING, CONTROLS, FLUE, AND INSTRUMENTATION.
2. COORDINATION: COORDINATE WITH GENERAL CONTRACTOR AND ALL OTHER TRADES.
3. CODES: THIS WORK SHALL CONFORM TO ALL APPLICABLE CODES LISTED ON SHEET T0.1 AND SHALL CONFORM TO NFPA AND ANSI STD.'S.
4. DRAWINGS: DRAWINGS ARE SCHEMATIC. ALL EQUIPMENT LOCATIONS AND PIPING CONNECTIONS SHALL BE VERIFIED IN THE FIELD AND APPROVED BY THE ENGINEER.
5. CUTTING: REPAIR ALL SURFACES DISTURBED TO MATCH ORIGINAL. NO CUTTING OF STRUCTURAL ELEMENTS ALLOWED WITHOUT PRIOR WRITTEN CONSENT OF THE STRUCTURAL ENGINEER.
6. MAINTENANCE: ALL EQUIPMENT SHALL BE ACCESSIBLE FOR MAINTENANCE. PROVIDE 2 COPIES OF OBM MANUAL TO OWNER, INCLUDING PARTS LISTS, BROCHURES, ETC.
7. GUARANTEE: ALL WORKMANSHIP, EQUIPMENT AND MATERIALS SHALL BE GUARANTEED FOR ONE YEAR AFTER DATE OF ACCEPTANCE.
8. SUBMITTALS: WITHIN 15 DAYS AFTER SIGNING A CONTRACT, PROVIDE SIX (6) SETS OF SUBMITTALS ON ALL EQUIPMENT AND MATERIALS.
9. MANUFACTURER'S DIRECTION: INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
10. INSTALLATION: THE INTENT OF THE DRAWINGS AND THE SPECIFICATIONS IS FOR A COMPLETE WORKING INSTALLATION. CONTRACTOR SHALL PROVIDE ALL ITEMS REQUIRED FOR A COMPLETE & OPERATIONAL SYSTEM WHETHER OR NOT SHOWN ON DRAWINGS OR SPECIFIED HEREIN.
11. CONTROLS: CONTRACTOR SHALL PURCHASE & INSTALL ALL CONTROLS FOR THIS EQUIPMENT. ALL CONTROL WIRING SHALL BE INSTALLED IN METALLIC CONDUIT.
12. BALANCING: CONTRACTOR SHALL BALANCE THE HYDRONIC SYSTEM TO WITHIN 10% OF THE DESIGN DELIVERIES USING BALANCING VALVES, CIRCUIT SETTERS, & PUMP SPEED CONTROLS. PROVIDE WRITTEN REPORT OF FINAL BALANCED HYDRONIC WATER FLOWS. WRITTEN REPORT SHALL INDICATE BALANCING & MEASUREMENT EQUIPMENT USED AND DATE OF LAST CALIBRATION.
13. EXAMINATION OF SITE: THE CONTRACTOR SHALL THOROUGHLY EXAMINE SITE AND SATISFY HIMSELF AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. THE CONTRACTOR SHALL VERIFY AT THE SITE ALL MEASUREMENTS AFFECTING THIS WORK AND SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF SAME. NO EXTRA COMPENSATION WILL BE ALLOWED ON ACCOUNT OF DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND THOSE INDICATED ON THE DRAWINGS.
14. MATERIALS:
   A. GALVANIZED: ALL ABOVE GROUND GAS PIPING SHALL BE STANDARD WEIGHT BLACK STEEL PIPE, SCHEDULE 40, ASTM A53 GRADE B, BLACK MALLEABLE IRON FITTINGS.
   B. WATER & BUNSTOCK DRAIN PIPING: HEATING HOT WATER PIPING/CONDENSATE DRAINS HARD COPPER WATER TUBE, CONFORMING TO ASTM B88, TYPE "L" ANNEALED, WITH WROUGHT COPPER FITTINGS.
   C. CONDENSATE DRAIN: ALL CONDENSATE PIPING FROM BOILERS SHALL BE SCHEDULE 40 PVC WITH SOLVENT JOINTS. SLOPE AT 1/4" PER FOOT.
   D. PIPE INSULATION: INSULATE ALL HOT WATER PIPING WITH FIBERGLASS 1.5 INCH NOMINAL THICKNESS OVENS CORNING FRAME AND SHIELD IN PLACE WITH VAPOR BARRIER OR EQUAL. ALL ELBOWS AND FITTINGS SHALL BE FACTORY PRE FABRICATED PVC COVERS. ON ALL EXPOSED HOT WATER DROPS, COVER INSULATION WITH PVC CORRINO AND SEAL PER MANUFACTURER'S RECOMENDATIONS.
   E. HANGERS: SHALL BE OF CNR MANUFACTURE. HANGERS ON PIPES ARE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMENDATIONS. INSTALLATION SHALL ALSO CONFORM TO CALIFORNIA PLUMBING CODE. SUPPORT PIPING WHERE NECESSARY, AT SUFFICIENTLY CLOSE INTERVALS TO KEEP IT IN ALIGNMENT AND TO PREVENT SAGGING.
   F. PIPING HANGERS AND SUPPORTS: WASCO OR APPROVED EQUAL, SOLID ALL THREAD RODS AND ROD CLIPS. SUPPORTS AND BEAM CLAMPS: MANUFACTURER APPROVED EQUAL.
   TRAPEZE HANGERS: WASCO OR APPROVED EQUAL, CHANNEL WITH PIPE CLAMPS AND GUIDES AS REQUIRED (INCLUDE TYPE TO BE USED IN DRAWINGS).

PIPE SIZE	MAXIMUM SPACING IN FEET	ROD SIZE
1/2"	5	3/8"
3/4" TO 1"	6	1/2"

   G. ANCHORS: PROVIDE SUFFICIENT ANCHORS IN PLACE TO LIMIT PIPE MOVEMENT ON THE DESIGN MOVEMENTS AND CONNECTING TO PIPE: ELLS, TEES, STRAINERS AND FIXTURE TRAPS. WASCO ELBOW ANCHOR PIPE, SIDEBOARD PIPE, GRIP BALANCED WALLBACK IRON, GRADE BEAM TIE BEAM, GROPE, WATTS DIELECTRIC UNIONS MY ONE COPPER CONNECTS TO STEEL.
   H. PIPE ISOLATION: DIELECTRIC, UNISTRUT, TOLCO, ISAT OR APPROVED EQUAL ISOLATORS.
   I. PIPE THICKNESS: STAMPED FROM 25 GAUGE STEEL AND CHROMIUM PLATED ON PIPES PASSING THROUGH SLEEVES IN WALLS, FLOORS, OR CEILINGS WHERE EXPOSED TO VIEW WITHIN A FINISHED AREA.
   J. INSTRUMENTATION:
   THERMOMETERS: ADJUSTABLE ANGLE TYPE, NONCURRY IN GLASS, UNION CONNECTION AND BRASS SUPPRANILE SOCKET. SIZE TO ANY SCALE, 9 DEGREE DIVISIONS. MEDICO OR APPROVED EQUAL.
   PRESSURE GAUGES: GRADE 2A, ACCURATE WITHIN 1/2% OF SCALE RANGE, BOURDON TUBE, SPRING TYPE WITH 4 1/2" DIAL, WITH ACCELERATING MOVEMENT. EACH GAUGE INSTALLED WITH NECESSARY PIPING, INCLUDING NECESSARY SHUT-OFF NEEDLE VALVE AND PRESSURE SNUBBER. AS REQUIRED. MEDICO OR APPROVED EQUAL.
   TRIPLE DUTY VALVES: CONVINATION SHUT OFF, BALANCING VALVE, & SPRING LOADED CHECK VALVE CONSTRUCTED OF ASTM B62 CAST BRONZE WITH DIFLED FLANGE CONNECTIONS IN ACCORDANCE WITH ASME B16.1. CLEAR FLOW TYPE OR APPROVED EQUAL.
   BALL VALVES: PROVIDE MISCO MODEL T-585 NO LEAD FREE BRONZE BODY, FULL PORT BALL VALVES FOR 1/2" THRU 2" PIPES.
   BUTTERFLY VALVES: QUARTER TURN SILVER LOCK HANDLE VALVE CONSTRUCTED OF DUCTILE IRON LUG BODY WITH ALUMINUM BRONZE DISK, MISCO MODEL 200 OR APPROVED EQUAL.
   FLEX CONNECTIONS: BRAIDED FLEXIBLE PUMP CONNECTORS CONSTRUCTED OF T-316L STAINLESS STEEL WITH ASA 150# FLANGES - METER MODEL GOLD PLUS SERIES OR APPROVED EQUAL.
   COMBUSTION FLUE: FLUE IN ALL CONNECTORS SHALL BE ALLOY-4C ALLOY STAINLESS STEEL WITH FACTORY FITTINGS. REMOVAL GROUP ONE, OR EQUAL.



3 BOILER FLUE THRU ROOF
M0.1 NO SCALE



1 BOILER & HEAT EXCHANGER MOUNTING
M0.1 NO SCALE

4 PIPING SUPPORT
M0.1 NO SCALE

2 BASE-MOUNTED PUMP
M0.1 NO SCALE

BOILER: HEATING DEMAND SEQUENCE:

GENERAL

ALL NEW EQUIPMENT INSTALLED FOR THIS PROJECT SHALL BE TIED INTO THE EXISTING DELTA ENTELIGENT BMS (BUILDING MANAGEMENT SYSTEM) WITH BACNET PROTOCOL. ELIMINATE CONTROLS FOR ANY REMOVED EQUIPMENT AS APART OF THIS PROJECT & ADD CONTROLS AS INDICATED HERE. CONTRACTOR SHALL PROVIDE ALL PROGRAMMING AS REQUIRED TO MEET THE SEQUENCE OF OPERATIONS.

ALL POINTS SHALL BE MAPPED TO THE FRONT END COMPUTER CONTROLLER LOCATED IN THE BOILER ROOM TO ALLOW FULL REMOTE MONITORING AND ADJUSTMENT OF SETPOINTS. ALL CONTROLLERS SHALL COMMUNICATE WITH THE MAIN COMMUNICATION MODULES WHICH SHALL IN TURN COMMUNICATE WITH THE SYSTEM FRONT END COMPUTERS WITH REMOTE ACCESS OVER INTERNET.

BROWSER BASED CONTROLS SHALL SHOW COMPLETE & SEPARATE COLORED DIAGRAM/MATIC REPRESENTATION OF EACH PIECE OF EQUIPMENT BEING CONTROLLED. DIAGRAMATIC REPRESENTATION SHALL INCLUDE THE FOLLOWING: GAS FIRED BOILERS, PRIMARY & SECONDARY BOILER PUMPS SHALL EACH HAVE THEIR OWN SCREENS WITH ALL HARDWARE & SOFTWARE POINTS DISPLAYED.

CONTRACTOR SHALL PROVIDE TRENDS OF VARIOUS POINTS & CONTROL FUNCTIONS AT COMPLETION OF INSTALLATION. TRENDS SHALL SHOW THE SYSTEM OPERATION AT 5 MINUTE INTERVALS OVER SEVERAL WEEKS TO CONFIRM STABLE OPERATION OF INSTALLED EQUIPMENT. CONTRACTOR SHALL COORDINATE DIRECTLY ON SITE WITH THE WATER BALANCING AGENT TO ASSURE THAT CONTROLS OPERATE TO ALLOW THE FLOW RATES & PERFORMANCE INDICATED ON THE PLANS.

THE INTENT OF THIS SEQUENCE IS TO ACHIEVE OPTIMUM BOILER & DOMESTIC HOT WATER SYSTEM PERFORMANCE & TO MINIMIZE ENERGY COSTS. PROGRAMMED SEQUENCES THAT ARE MODIFIED AT THE EXPENSE OF HIGHER ENERGY COSTS SHALL NOT BE IMPLEMENTED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE ENGINEER.

BOILERS & PUMPS

THE BOILERS & THEIR ASSOCIATED PRIMARY HOT WATER PUMPS SHALL BE STARTED AUTOMATICALLY BY THE THE BMS UPON A CALL FOR HEATING BY ANY ZONE OR DOMESTIC HOT WATER HEAT EXCHANGER FOR MORE THAN 5 MINUTES (ADJ.). THE BOILERS & PUMPS SHALL TURN OFF WHENEVER THERE IS NO DEMAND FOR HOT WATER BY ANY COIL FOR MORE THAN 10 (LIMIT). ONCE STARTED, THE BOILER SHALL OPERATE UNDER ITS OWN CONTROLS TO MAINTAIN 170 ° PRIMARY HOT WATER SUPPLY TEMPERATURE. FLOW SWITCHES SHALL LOCK OUT BOILER UPON LOSS OF PRIMARY FLOW. BOILER OPERATION SHALL LOCK OUT BOILER UPON LOSS OF PRIMARY FLOW. THE BMS SHALL ALTERNATE LEAD/LAG BOILERS & SECONDARY PUMPS ON A DAILY BASIS BETWEEN STARTING THE FIRST OR SECOND BOILER & BOILER PUMP (E.G. B-1 & BP-1), AND SECONDARY PUMP (HWP-1 OR HWP-2).

A CALL FOR DOMESTIC HOT WATER WILL BE DIRECTLY WIRED FROM (E) HXWH-1 & (E) HXWH-1 WATER HEATER TO CENTRAL BMS & SHALL PROMPT BOILER OPERATION TO ENERGIZE BOILERS (B-1 & B-2). BOILER SHALL OPERATE PUMPS & SUCCESSFULLY PROVE SAFETY INTERLOCKS (LOW WATER, BLOCKED FLUE, HIGH LIMIT, GAS PRESSURE, ETC.) AFTER WHICH IGNITION MODULE ENERGIZES BLOWER FOR A PRE-PURGE CYCLE THEN PRESSURIZES THE AIRBOX. ONCE AIRFLOW IS PROVEN, THE IGNITION MODULE WILL ATTEMPT IGNITION (UP TO 3 TRIES). IF IGNITION IS NOT ACHIEVED AFTER 3 ATTEMPTS, BOILER FAILURE ALARM IS INITIATED.

IF FLAME IS SENSED, THE GAS VALVE WILL REMAIN OPEN AS LONG AS THERE IS CALL FOR HEAT TO MAINTAIN HOT WATER SETPOINT TEMPERATURES.

2-WAY HYDRONIC VALVE SHALL OPEN UPON A CALL FOR HEAT & CLOSE ONCE HEATING SETPOINT IS SATISFIED.

ONCE THE CALL FOR HEAT IS SATISFIED, THE GAS VALVE CLOSES & THE BLOWER CONTINUES TO RUN FOR 30 SECONDS (PER BOILER MFR). THE BOILER PUMPS (BP-1 & BP-2) WILL CONTINUE TO RUN FOR MIN. 8 MINUTES (PER BOILER MFR). SECONDARY HOT WATER PUMPS (HWP-1 OR HWP-2) SHALL CONTINUE TO RUN FOR MIN. 10 MIN.

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REVISION	DATE
FOR DESIGN REVIEW	06/05/2020

REGISTERED PROFESSIONAL ENGINEER No. M33543 09 SEPT. 30, 2020 MICHAEL P. WALLACE STATE OF CALIFORNIA

COLE SUMMIT CONSULTANTS

AXIOM DESIGNERS

DENIS J. COPPAGE | MICHAEL WOODWARD | MARK J. WATTS-OLLE
CBE.INC.#0020588

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2
SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95076

LEGEND, SCHEDULE, NOTES AND SPECIFICATIONS - MECHANICAL

DATE	6/10/2021
DRAWN	MJW/JE
DESIGN	CBED
JOB	2012039
SHEET	M0.1

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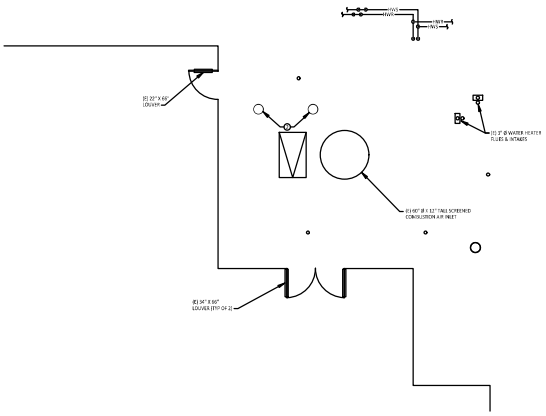
GENERAL NOTES:

1. REMOVE ALL ABANDONED MATERIALS & ELEMENTS ON ROOFS ROOM MODE. CONFIRM TEMPORAL WITH OWNER'S REPRESENTATIVE PRIOR TO REMOVAL.

SHEET NOTES:

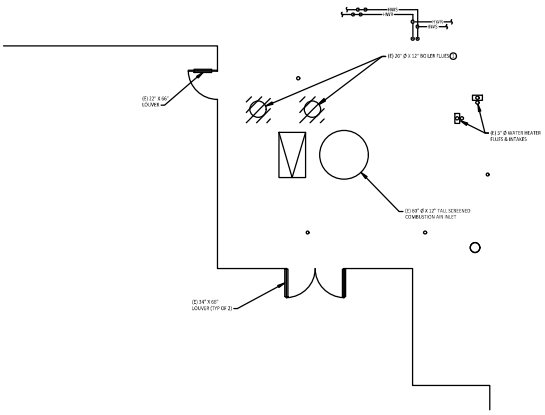
1. REMOVE (3) BOILER FLUES AND REPLACE WITH NEW AFTER INSTALLING NEW BOILERS.
2. NEW 10" BOILER FLUE TERMINATION AT (3) OPENING FOR REMOVED FLUE. INSTALL PER SPEC.



2 / M1.0 **PARTIAL ROOF PLAN MECHANICAL - NEW**

SCALE: 1/4" = 1'-0"

NORTH



1 / M1.0 **PARTIAL ROOF PLAN MECHANICAL - DEMOLITION**

SCALE: 1/4" = 1'-0"

NORTH

REVISIONS	DATE
IFC DRAWINGS	06/01/2022

REGISTERED PROFESSIONAL ENGINEER
No. M33543
EXP. SEPT. 30, 2024
MECHANICAL
STATE OF CALIFORNIA

COLE CONSULT ENGINEERING

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MONTEREY | MARIN | SANTA CRUZ

CMEAA #2022R140

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE CA 95023

ROOF PLAN - MECHANICAL

DATE	6/1/2022
SCALE	1/4" = 1'-0"
DRAWN	CMED
JOB #	2012.0590
SHEET	M1.0

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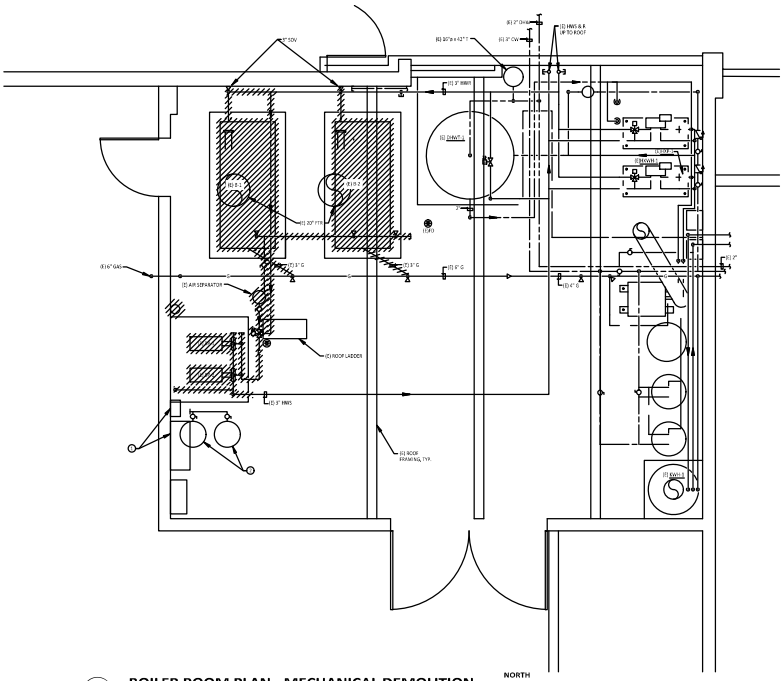
GENERAL NOTES

1. PRE-BALANCE & DALANCE REPORT: PRIOR TO STARTING WORK PROVIDE WRITTEN REPORT BOTH BEFORE & DECONTRAMIN BY FLOW & PRESSURE AT EVERY COIL & PER HEATING COILS (E.G. AIR HEATING OR BASEBOARD) AS DIRECTED BY OWNER REPRESENTATIVE. FINAL BALANCE REPORT AT PROJECT CLOSEOUT WILL INCLUDE INDEAU REMENT OF SAME PARAMETERS & DOLPIMENT FOR COMPARISON.
2. OBSERVE ALL PIPING RECOMMENDATIONS BY EQUIPMENT MANUFACTURER AS LISTED IN INSTALLATION MANUAL, INCLUDING INSTALLATION OF FACTORY PROVIDED HNS STRAINER, 12" - 30" DISTANCE BETWEEN PRIMARY HWS & HWR CONNECTIONS TO SECONDARY PIPING, AND PERFORMING WATER CHEMISTRY ANALYSIS AND TREATMENT TO MEET MANUFACTURER REQUIREMENTS FOR HARDNESS, CHLORIDES, CONDUCTIVITY, ACIDITY, IRON, COPPER, SODIUM, ETC.
3. SEE ELECTRICAL PLANS FOR POWER TO VENTS.
4. CONTRACTOR SHALL EMPLOY SERVICES OF A LOCATING AGENCY TO VERIFY LOCATION OF STRUCTURAL STEEL WITHIN CONCRETE WALLS & ROOF STRUCTURE. CONTRACTOR SHALL THEN DETERMINE ANCHORAGE TO MPS & PENETRATIONS TO AVOID ANY STRUCTURAL STEEL BY 6IN IN 2" IN EACH DIRECTION. COORDINATE LAYOUT WITH OWNER REPRESENTATIVE PRIOR TO PROCEEDING WITH WORK.
5. (E) ROOF STRUCTURE AT APPROXIMATELY 144" ABOVE BOILER ROOM FINISHED FLOOR.

SHEET NOTES:

1. (E) BOILER CONTROL PANEL TO REMAIN.
2. (E) EXPANSION TANKS TO REMAIN.



1 / M2.1 **BOILER ROOM PLAN - MECHANICAL DEMOLITION**

SCALE: 1/2" = 1'-0"

REVISIONS	DATE
HC DRAWINGS	06/01/2022

REGISTERED PROFESSIONAL ENGINEER — CHAN L. KING — No. M33543 — EXP. SEPT. 30, 2024 — MECHANICAL — STATE OF CALIFORNIA

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90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

MECHANICAL PLAN - DEMOLITION

DATE	6/10/2022
SCALE	1/2" = 1'-0"
DRAWN	CCOO
REV	2/22/2022
SHEET	M2.1

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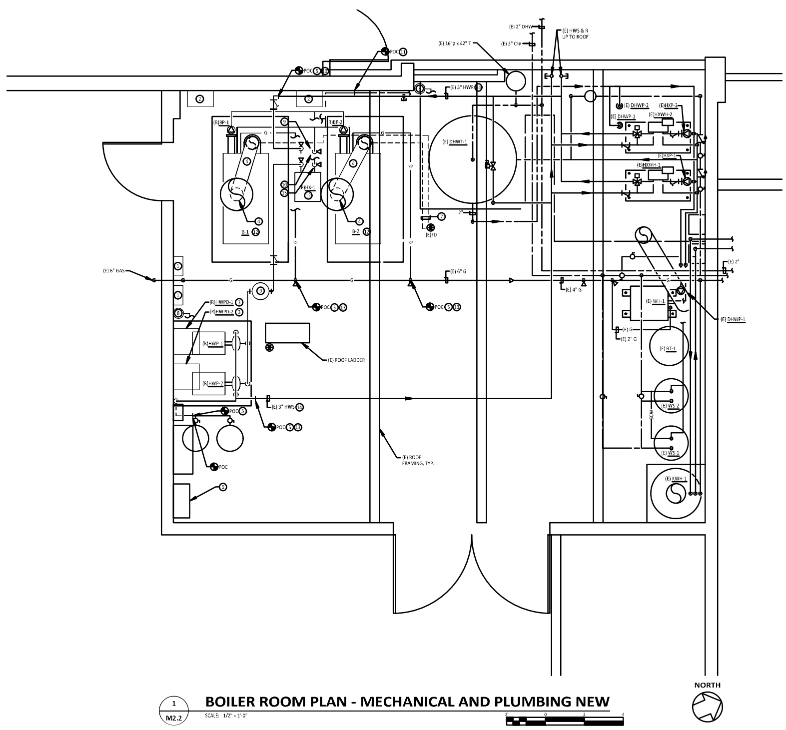

1 / M2.2 **BOILER ROOM PLAN - MECHANICAL AND PLUMBING NEW**

SCALE: 1/2" = 1'-0"

GENERAL NOTES

1. PRE-BALANCE & BALANCE REPORT: PRIOR TO STARTING WORK PROVIDE WRITTEN REPORT MEASURING & DOCUMENTING (E)FLOW & PRESSURE AT (E)HWP-1 & FOUR HEATING COILS (E.G. AIR HEATING & INDIRECT WATER HEATERS) AS DIRECTED BY OWNER REPRESENTATIVE. FINAL BALANCE REPORT AT PROJECT CLOSEOUT SHALL INCLUDE MEASUREMENT OF SAME PARAMETERS & EQUIPMENT FOR COMPARISON.
2. OBSERVE ALL PIPING RECOMMENDATIONS BY BOILER MANUFACTURER AS LISTED IN INSTALLATION MANUAL AND PERFORMING WATER CHEMISTRY ANALYSIS AND TREATMENT TO MEET MANUFACTURER REQUIREMENTS FOR HARDNESS, CHLORIDES, CONDUCTIVITY, ACIDITY, IRON, COPPER, SODIUM, ETC.
3. SEE M4.1 FOR PIPING DIAGRAMS.
4. SEE ELECTRICAL PLANS FOR POWER TO UNITS.
5. SEE 4/M0.1 FOR PIPING SUPPORT DETAIL.
6. (E)ROOF STRUCTURE AT APPROXIMATELY 140" ABOVE MECHANICAL ROOM FINISHED FLOOR. (E)ROOF DECK AT APPROXIMATELY 170" AFF.
7. ALL RELOCATED EQUIPMENT & MATERIAL FROM 1080 FACILITY SHALL INCLUDE COMPLETE RECONSTRUCTION WITH ANY ORIGINAL ACCESSORIES & INSTRUMENTATION (E.G. A PUMP SHALL BE RELOCATED COMPLETELY WITH PUMP INLET DIFFUSER, FLEX CONNECTOR, SHUT OFF VALVES, PRESSURE GAUGES, ETC.). CONTRACTOR IS RESPONSIBLE FOR INSPECTING & TESTING EQUIPMENT, ACCESSORIES, & INSTRUMENTATION DURING INSTALLATION. NOTIFY OWNER OF REPLACEMENT IF NEEDED.
8. ALL ABANDONED BOILER SYSTEM COMPONENTS, PIPING, MATERIALS, INSTRUMENTATION, ETC. AT 1080 EMELINE FACILITY NOT EXPLICITLY NOTED ON PLANS MAY BE SALVAGED BY CONTRACTOR FOR REINSTALLATION AT 90 ROUNTREE BOILER ROOM UPON APPROVAL FROM OWNER. COORDINATE WITH OWNER FOR ACCESS & RECOVERY.

SHEET NOTES:

1. BOILER DISCONNECT. SEE ELECTRICAL DRAWINGS FOR LOCATION & REQUIREMENTS.
2. RELOCATED BP-1 & BP-2 DISCONNECT. SEE ELECTRICAL DRAWINGS FOR LOCATION & REQUIREMENTS.
3. RELOCATED HWP-1 & HWP-2 DISCONNECTS & VFD PANELS. SEE ELECTRICAL DRAWINGS FOR LOCATION & REQUIREMENTS.
4. NEW 10" BOILER FLUE. REMOVE (E)20" FLUE & ROUTE NEW FLUE THRU (E)PENETRATION PER 3/M0.1.
5. REVISE PIPING AS INDICATED. SEE M4.1 FOR PIPING DIAGRAMS.
6. (E)DELTA CONTROLS PANEL FOR CONNECTION OF NEW POINTS & DEVICES.
7. ROUTE ALL NEW DRAINS TO STUB OUT DIRECTLY OVER (E)FLOOR DRAIN INCLUDING BOILER CONDENSATE DRAINS, T&PRV DRAINS, ETC. SEE 2/M4.1.
8. CHEMICAL POT FEEDER & PIPING. SEE 2/M4.1.
9. PROVIDE 3" NORMALLY CLOSED BYPASS/BRIDGE PIPING PER 2/M4.1. FOR DIRECT PRIMARY/SECONDARY PIPING CONFIGURATION TO BYPASS HEAT EXCHANGER WHEN NEEDED. FIELD CONFIRM FINAL PIPING LAYOUT WITH ENGINEER PRIOR TO INSTALLATION. PROVIDE RELOCATED AIR & DIRT SEPARATOR IN THIS LOCATION. SEE 2/M4.1.
10. FERNOX TF1 FILTER AT (R)BHX-1. SEE 2/M4.1.
11. DOMESTIC MAKEUP WATER W/WATER METER. BADGER 5/8" RECORDALL OR EQUAL.
12. ANCHOR BOILER & HEAT EXCHANGER TO (E)HOUSEKEEPING PAD OR (E)CONCRETE SLAB. SEE 1/M0.1. INSTALLER IS RESPONSIBLE FOR FIELD CONFIRMING PIPING CONNECTIONS TO HEAT EXCHANGER PRIOR TO LAYING OUT PIPING & FINALIZING INSTALLATION. CONFIRM CONNECTION POINTS WITH ENGINEER SHOULD THERE BE ANY QUESTIONS REGARDING PROPER TIE-IN.
13. OTHER THAN CONNECTIONS TO BOILERS, BASE MOUNTED PUMPS, & FLOOR MOUNTED EQUIPMENT, ALL PIPING SHALL BE INSTALLED MINIMUM 90" A.F.F. SEE 4/M0.1 FOR PIPING SUPPORTS AT ROOF STRUCTURE.
14. (E)HWS & R PIPING TO REMAIN. INSULATE ALL NEW & EXISTING UNINSULATED HWS & R PIPING IN ACCORDANCE WITH W/SPECIFICATIONS.
15. HEAT EXCHANGER BYPASS/BRIDGE PIPING. SEE 2/M4.1.

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REVISIONS	DATE
IFC DRAWINGS	06/05/2023

REGISTERED PROFESSIONAL ENGINEER SEAN L. RING No. M33543 EXP. SEPT. 30, 2024 MECHANICAL STATE OF CALIFORNIA

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90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

BOILER ROOM PLAN - MECHANICAL AND PLUMBING NEW

DATE	6/10/2022
SCALE	1/2" = 1'-0"
DRAWN	CADD
JOB	20220030
SHEET	M2.2

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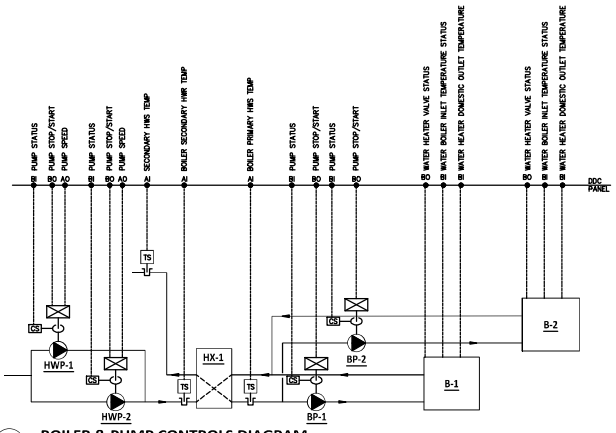


1 M4.1 **BOILER & PUMP CONTROLS DIAGRAM**

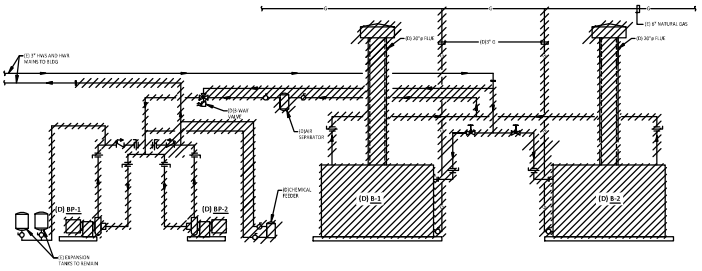
SCALE: NO SCALE

CONTROLS GENERAL NOTES

1. THIS PROJECT INCLUDES TIE-IN TO AN EXISTING DELTA CONTROLS DDC SYSTEM ON THE DEXTERITY FACILITY CAMPUS (BOILER PAD). CONTRACTOR SHALL UPGRADE THE SYSTEM AS NEEDED TO ADDRESS ANY LIMITATIONS IN THE EXISTING HARDWARE (ELECTRONIC CONTROLLERS, MECHANICAL ACTUATORS, CONTROL POINT CAPACITY, ETC.) THAT AS REQUIRED TO PERFORM THE STATED SEQUENCE OF OPERATION. ANY REQUIRED UPGRADES NECESSARY TO DELIVER THE SPECIFIED CONTROLS FUNCTIONALITY THAT IS DISCOVERED AFTER BIDDING SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
2. PROVIDE OWNER WITH A WINDOWS COMPATIBLE & INSTALLABLE COPY OF THE COMPLETE CONTROLS SOFTWARE ON A COMPACT DISC (CD) AT PROJECT COMPLETION. INCLUDE ANY SPECIAL INSTRUCTIONS FOR INSTALLATION AS A SEPARATE TEXT FILE / DOC OR .PDF FORMATS ON THAT CD. SOFTWARE SHALL BE SUFFICIENT FOR REINSTALLATION OF THE CONTROLS SOFTWARE ON A WORKSTATION SHOULD THE EXISTING INSTALLATION BECOME CORRUPTED AND UNUSABLE.
3. ALL WIRING SHALL BE PER ELECTRICAL DRAWINGS & SPECIFICATIONS.
4. CONTROLS CONTRACTOR SHALL INSTALL SYSTEM AS DEFINED BY THESE PLANS AND THE ACCOMPANYING BOOK SPECIFICATIONS.
5. ALL ELECTRONIC MEASUREMENT MONITORING AT CONTROLS FRONT END SHALL BE COORDINATED & VERIFIED WITH THE BALANCING CONTRACTOR.

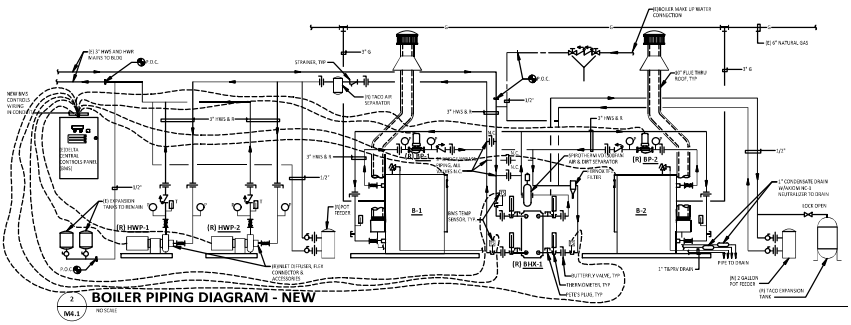
HVAC CONTROLS LEGEND

SYMBOL	ABBRV.	IDENTIFICATION	ABBRV.	IDENTIFICATION
TS	TS	TEMPERATURE SENSOR	AI	ANALOG INPUT
			AO	ANALOG OUTPUT
			ACD	AUTOMATED CONTROL DAMPER
			ADJ.	ADJUSTABLE
TS	TS	TEMPERATURE SENSOR W/THERMOWELL	ATS	AVERAGING TEMPERATURE SENSOR
			BI	BINARY INPUT
			BMS	BUILDING MANAGEMENT SYSTEM
			BO	BINARY OUTPUT
DP	DP	DIFFERENTIAL PRESSURE SENSOR	DDC	DIRECT DIGITAL CONTROLS
			DIO	DISTRIBUTED INPUT/OUTPUT MODULE
			DP	DIFFERENTIAL PRESSURE
			EA	EXHAUST AIR
CS	CS	CURRENT SWITCH	OA	OUTSIDE AIR
			RA	RETURN AIR
			VFD	VARIABLE FREQUENCY DRIVE
	ATS	AVERAGING TEMPERATURE SENSOR	TS	TEMPERATURE SENSOR
		RELAY CONTACT, NORMALLY OPEN		
VFD		VARIABLE FREQUENCY DRIVE (VFD) CONTROLLER		



1 M4.1 **BOILER PIPING DIAGRAM - DEMOLITION**

NO SCALE



2 M4.1 **BOILER PIPING DIAGRAM - NEW**

NO SCALE

REVISION	DATE
PC DRAWINGS	06/05/2023

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

BOILER CONTROLS AND PIPING & INSTRUMENTATION DIAGRAMS

DATE	6/16/2023
DRAWN	MDSE
DESIGN	CRED
JOB	2022-0330

M4.1

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GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS. MATERIALS AND EQUIPMENT SHALL BE UL LISTED AND LABELED FOR THE APPLICATION.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND INSPECTION FEES REQUIRED BY THE CONTRACT WORK.
3. CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO BIDDING AND ALLOW FOR ALL FIELD CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL WORK NOTED AND DETAILED OUT ON ALL CONTRACT DOCUMENTS. THE CONTRACTOR SHALL OBTAIN INFORMATION AND BE FAMILIAR WITH ALL OTHER TRADES WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION BETWEEN OTHER TRADES ON PROJECT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF PERSONS AND PROPERTY AND SHALL PROVIDE INSURANCE COVERAGE AS NECESSARY FOR LIABILITY AND PERSONAL PROPERTY DAMAGE. TO FULLY PROTECT THE OWNER, ARCHITECT AND ENGINEER FROM ANY AND ALL CLAIMS RESULTING FROM THE WORK.
5. CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS AT THE PROJECT SITE INDICATING ALL MODIFICATIONS TO ELECTRICAL SYSTEMS. THE CONTRACTOR SHALL AT THE CONCLUSION OF THE PROJECT PROVIDE ACCURATE "AS-BUILT" DRAWINGS ACCEPTABLE TO THE ARCHITECT.
6. ALL MATERIALS PROVIDED TO THE PROJECT SHALL BE NEW. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL INCIDENTAL MATERIALS REQUIRED FOR A COMPLETED INSTALLATION.
7. CONTRACTOR SHALL PROVIDE TO THE OWNER A CONSTRUCTION SCHEDULE OF ELECTRICAL WORK. THE CONSTRUCTION SCHEDULE SHALL IDENTIFY ALL SIGNIFICANT MILESTONES WITH COMPLETION DATES.
8. CONTRACTOR SHALL PROVIDE ALL REQUIRED CUTTING, PATCHING, EXCAVATION, BACKFILL AND REPAIRS NECESSARY TO RESTORE DAMAGED SURFACES TO EQUAL OR BETTER THAN ORIGINAL CONDITION EXISTING AT START OF WORK.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PAINTING ALL EXPOSED CONDUITS AND ELECTRICAL EQUIPMENT. REFER TO ARCHITECT'S PAINTING SECTION FOR REQUIREMENTS.
10. ALL ELECTRICAL EQUIPMENT INSTALLED OUTDOORS SHALL BE WEATHERPROOF. EXTERIOR CONDUITS RUN INTO BUILDINGS SHALL BE INSTALLED WITH PITCHING, CAULKED AND SEALED. CONDUITS FOR EXTERIOR ELECTRICAL DEVICES SHALL BE RUN INSIDE BUILDING WALLS EXCEPT AS NOTED ON DRAWINGS.
11. ALL CONDUITS UNLESS OTHERWISE NOTED ON DRAWINGS SHALL HAVE AS A MINIMUM TWO (2) #12 WITH ONE (1) #12 GROUND. "TICK" MARKS SHOWN ON CIRCUITRY ARE FOR ROUGH-IN PLAN ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WIRES AND WIRE SIZES REQUIRED BY LATEST CODE.
12. ALL BRANCH CIRCUITS SHALL HAVE INDIVIDUAL NEUTRALS. SHARED NEUTRALS ON MULTIWIRE CIRCUITS IS NOT ALLOWED.
13. COORDINATE ALL CONDUIT RUNS, ELECTRICAL EQUIPMENT AND PANELS WITH ALL OTHER WORK TO AVOID CONFLICTS.
14. CONTRACTOR SHALL PROVIDE IN EVERY NEW EMPTY CONDUIT A DRAWN STRING FOR USE IN FUTURE CONSTRUCTION.
15. ALL CONDUIT SHALL BE CONCEALED WHERE POSSIBLE. CUT AND PATCHED EXISTING WALLS WHERE NECESSARY. WHERE IT IS NECESSARY TO CUT OR BORE EXISTING STRUCTURE, WALL OR FLOOR NEW ELECTRICAL WORK. GET ENGINEER'S PERMISSION FROM THE ARCHITECT PRIOR TO STARTING WORK. REUSE EXISTING CONDUIT WHERE POSSIBLE.
16. WHERE IT IS NOT POSSIBLE TO REUSE EXISTING CONDUIT OR RUN NEW CONCEALED CONDUIT USE NON-METALLIC SURFACE RACEWAY AND BOXES. ROUTING OF ALL NON-METALLIC RACEWAYS SHALL BE APPROVED BY THE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO ROUGHING.
17. EXTENSION RINGS OR RESET BOXES TO BE FLUSH WITH NEW WALL THICKNESS.
18. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.
19. ALL INSTALLATION OF EXPOSED SURFACE MOUNTED EXTERIOR FIXTURES, AREAS SHALL BE REVIEWED BY OWNER BEFORE ROUGHING. CONTRACTOR IS TO DETERMINE THE ACCESSIBILITY OF ATTIC, FURRED SPACE, HOLLOW WALL/BOX, ETC. IN BOX AREA AND PROVIDE WITH CHANGES IF SYSTEM CANNOT BE ROUTED CONCEALED EITHER BY CHANGE OR ACCESSIBILITY. CONTRACTOR IS TO DO SO IF INACCESSIBILITY IS DETERMINED. CONTRACTOR SHALL INSTALL SURFACE MOUNTED RACEWAY IN THE MOST AESTHETICALLY PLEASING MEANS AS DETERMINED BY THE OWNER. NO ALLOWANCE FOR ADDITIONAL COMPENSATION DUE TO ROUTING AS DIRECTED BY THE OWNER WILL BE MADE.

ELECTRICAL SYMBOLS & ABBREVIATIONS

SYMBOLS & ABBREVIATIONS SHOWN ARE FOR GENERAL USE, DISREGARD THOSE WHICH DO NOT APPEAR ON THE PLANS.

FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
EMERGENCY ONLY LIGHT
STRIP FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
LUMINAIRE - RECESSED - SEE SCHEDULE
RECESSED WALL WASHER
LUMINAIRE - SURFACE MOUNTED - SEE SCHEDULE
LUMINAIRE - POLE OR POST MOUNTED - SEE SCHEDULE
LUMINAIRE - WALL MOUNTED SEE SCHEDULE
BOLLARD OR PATH LIGHT - SEE SCHEDULE
EXIT LIGHT - DIRECTIONAL ARROWS AS INDICATED - SEE SCHEDULE
TRACK LIGHTING - SEE SCHEDULE
EMERGENCY LIGHT
DIGITAL DUAL TECHNOLOGY OCC. SENSOR
LIGHTING CONTROL OCCUPANCY SENSOR CORNER MOUNTED
DIMMER ROOM CONTROLLER
PLUG LOAD CONTROLLER
ROOM LIGHTING CONTROLLER
LIGHTING CONTROL PANEL
DIGITAL DAYLIGHT SENSOR
SINGLE POLE SWITCH ★★ & CIRCUIT CONTROLLED
THREE WAY SWITCH ★★
FOUR WAY SWITCH ★★
MANUAL MOTOR STARTER
KEY OPERATED SWITCH ★★
LIGHTING DIMMER ★★
DIGITAL ON/OFF SWITCH ★★
DIGITAL DIMMER SWITCH ★★
DIGITAL DUAL TECHNOLOGY LIGHTING SENSOR ★★
DIGITAL DUAL TECHNOLOGY WALL OCC. SENSOR ★★
WALL OCCUPANCY SENSOR ★★
DOUBLE SWITCHED DUAL OCCUPANCY SENSOR ★★
DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR ★★
SWITCHING DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR ★★
SECURITY DOOR CONTACTS
SECURITY MOTION DETECTOR
CCTV CAMERA
SECURITY SYSTEM KEYPAD
DOOR BELL PUSHBUTTON
DOOR CHIME WITH LED
RECEPTACLE - DUPLEX ★
DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
GFCI CONVENIENCE RECEPTACLE - DUPLEX ★
GFCI CONVENIENCE DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
RECEPTACLE DOUBLE DUPLEX ★
HALF SWITCHED DUPLEX RECEPTACLE ★
SINGLE RECEPTACLE ★
DUPLEX RECEPTACLE - CEILING MOUNTED
HC LETTER INDICATES DUPLEX HALF CONTROLLED RECEPTACLE ★
C LETTER INDICATES DUPLEX FULLY CONTROLLED RECEPTACLE ★
FLOOR MOUNTED DUPLEX RECEPTACLE
FLOOR MOUNTED BOX
POWER OUTLET - SEE PLANS FOR NEMA TYPE ★
POWER POLE
WALL TELEPHONE OUTLET ★★
VIDEO/DATA WALL OUTLET ★
VIDEO/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
SURFACE MOUNTED VIDEO/DATA WALL OUTLET ★
SURFACE MOUNTED VIDEO/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
WIRELESS ACCESS POINT (WAP) - CEILING MOUNTED
WIRELESS ACCESS POINT (WAP) - WALL MOUNTED - FIELD VERIFY HEIGHT
VIDEO/DATA OUTLET - FLOOR MOUNTED
TV OUTLET ★
VIDEO/DATA OUTLET - CEILING MOUNTED
INTERIOR SPEAKERS CEILING MOUNTED
INTERIOR SPEAKERS WALL MOUNTED
FLOOD: HI-LIT HIGH LUX, VERIFY BEFORE INSTALLATION
PANELBOARD - FLUSH MOUNTED
EQUIPMENT PANEL - FLUSH MOUNTED
PANELBOARD - SURFACE MOUNTED
EQUIPMENT PANEL - SURFACE MOUNTED
METER W/ CURRENT TRANSFORMER
JUNCTION BOX - CEILING OR WALL MOUNTED. SIZE PER CODE. TAPE AND TAG WIRES
MOTOR CONNECTION
NON-FUSED DISCONNECT SWITCH
FUSED DISCONNECT SWITCH. FUSED WITH DUAL ELEMENT FUSES SIZED PER EQUIPMENT NAMEPLATE DATA
COMBINATION STARTER FUSED DISCONNECT SWITCH. FUSED DISCONNECT SWITCH ELEMENT FUSES SIZED PER EQUIPMENT NAMEPLATE DATA
MAGNETIC STARTER - NEMA SIZE 1 UNLESS OTHERWISE SPECIFIED
CIRCUIT BREAKER
GROUND ROD WITH GROUND WELL BOX
GROUND ELECTRODE
NORMALLY OPEN CONTACT
NORMALLY CLOSED CONTACT
TRANSFORMER - SEE SINGLE LINE FOR SIZE
PULLBOX
FLEX CONDUIT WITH CONNECTION
CONDUIT - UP
CONDUIT - DOWN
CONDUIT EMERGENCY SYSTEM
LV LOW VOLTAGE WIRING
SURFACE METAL OR NON-METALLIC RACEWAY
CONDUIT - CONCEALED IN WALLS OR CEILING
CONDUIT - EXISTING
CONDUIT - BELOW SLAB OR UNDERGROUND. SIZE ★
CAPPED OR STUBOUT CONDUIT
CONDUIT COMBINATION
CONDUIT - HOME RUN TO PANEL. TERMINAL CABINET, ETC., RUN IN WALLS WITH CROSSHATCHES INDICATE NUMBER OF #12 AWG WIRES WHEN MORE THAN TWO. USE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODES. ORIGINATE WIRES WITH NUMBER ADJACENT TO INDICATORS. WIRE SIZE OTHER THAN #12 AWG.
SHEET NOTE REFERENCE SYMBOL. SEE ASSOCIATED NOTE ON SAME SHEET
SCHEDULE SYMBOL. SEE ASSOCIATED NOTE ON SAME SHEET
DETAIL NOTE REFERENCE SYMBOL. SEE ASSOCIATED NOTE ON SAME DETAIL
F501 FEEDER DESIGNATION. SEE ASSOCIATED NOTE ON SAME DETAIL
1 / E0.2 DETAIL NUMBER. DETAIL OR SECTION REFERENCE. SHEET NUMBER
TV DATA INDICATES QUANTITY OF TELEPHONE OUTLETS
TV DATA INDICATES QUANTITY OF DATA OUTLETS

ABBREVIATIONS

A	AMPERE	GFCI	GROUND FAULT INTERRUPTING			NTS	NOT TO SCALE
AFF	ABOVE FINISHED FLOOR	GR	GROUND			OAH	OVERALL HEIGHT
ALUM	ALUMINUM	GRND, G	GROUND			OC	ON CENTER
ARCH	ARCHITECT	GRS	GALVANIZED RIGID STEEL			OH	OVERHEAD
AWG	AMERICAN WIRE GAUGE	HT	HEIGHT			PA	PUBLIC ADDRESS
BYP	BYPASS	IC	INTERCOM			PB	PULL BOX
BKR	BREAKER	IDF	INTERMEDIATE DISTRIBUTION FRAME			PF	POWER FACTOR
CAT5	CABLE CAT 5					PH	PHASE
CB	CIRCUIT BREAKER	INCAND	INCANDESCENT			PIR	PASSIVE INFRARED
CCTV	CLOSED CIRCUIT TV	JB	JUNCTION BOX			PNL	PANEL
CKT	CIRCUIT	KV	KILOVOLT			PV	PHOTOVOLTAIC
CLG	CEILING	KVA	KILOVOLT AMPERES			PVC	POLYVINYL CHLORIDE
CLR	CENTER LINE	KW	KILOWATT			PWR	POWER
CUO	CONDUIT ONLY	LCP	LIGHTING CONTROL PANEL			(R)	EXISTING TO BE REMOVED
CTR	CENTER					(RR)	REMOVABLE POLE
C	CHASES	LTG	LIGHTING			RECPTS	RECEPTACLES
DIM	DIMMER	LV	LOW VOLTAGE			REQD	REQUIRED
DIST	DISTRIBUTION	KCM	THOUSAND CIRCULAR MILS			REQMTS	REQUIREMENTS
(E)	EXISTING					SCT	SCHEDULE
EC	ELECTRICAL CONTRACTOR	MCB	MAIN CIRCUIT BREAKER			SHT	SHEET
(EL)	EVERGREEN LIGHT	MCA	MINIMUM CIRCUIT AMPACITY			STG	SYSTEM GROUND
EM	EMERGENCY	MDF	MAIN DISTRIBUTION FRAME			SW	SWITCH
EMT	ELECTRICAL METALLIC TUBING	MECH	MECHANICAL			SWBD	SWITCHBOARD
EQUIP	EQUIPMENT	MH	METAL HALIDE			TTB	TELEPHONE TERMINAL BOARD
EV	ELECTRICAL VEHICLE	MLO	MAIN LUGS ONLY			TYP	TYPICAL
EW	EACH WAY	MPDE	MAIN PORTAL OF ENTRANCE			UON	UNLESS OTHERWISE NOTED
FACP	FIRE ALARM CONTROL PANEL	MTG	MOUNTING			UG	UNDERGROUND
		MOCP	MAXIMUM OVER CURRENT PROTECTION			V	VOLT
FC	FOOT CANDLE					VD	VOLTAGE DROP
FR	FRAME	(N)	NEW			W	WATT
FL	FLOOR	NEC	NATIONAL ELECTRICAL CODE			WP	WATERPROOF
FLA	FULL LOAD AMPS					WP	WEATHERPROOF
(F)	FUTURE	(NL)	NIGHT LIGHT			XFMR	TRANSFORMER
GC	GENERAL CONTRACTOR	NO, #	NUMBER				
		NOM	NOMINAL				

FIRE ALARM

NOTE: SEE THE FIRE ALARM DRAWINGS FOR QUANTITIES AND MOUNTING HEIGHTS.

MANUAL PULL STATION
STROBE ONLY
HORN ONLY
MH HORN
HORN/STROBE
CHIME/STROBE
HEAT DETECTOR
SMOKE DETECTOR
CARBON MONOXIDE ALARM
DUCT SMOKE DETECTOR
TAMPER SWITCH
FLOW SWITCH
POST INDICATING VALVE
FIRE SMOKE DAMPER
BELL (GONG)
FIRE ALARM CONTROL PANEL

APS	AUXILIARY POWER SUPPLY
FSA	FIRE SYSTEM ANNUNCIATOR
FTS	FIRE ALARM TRANSPONDER OR TRANSMITTER
EPS	ELEVATOR STATUS SPECIAL
FAC	FIRE ALARM COMMUNICATOR
RTA	REMOTE ANNUNCIATORS
EOL	END OF LINE

★ = 15" AFF, TO BOTTOM OF BOX. (LOW)
★★ = 48" AFF, TO TOP OF BOX. (LOW)
(#) NUMBER IN BRACKETS DENOTES NUMBER OF CABLE DROPS WHEN MORE THAN (2)

APPLICABLE CODES & STANDARDS

CODES:

1. 2019 CALIFORNIA ADMINISTRATIVE CODE (CCR, TITLE 24, PART 1).
2. 2019 CALIFORNIA BUILDING CODE (CBC) (CCR, TITLE 24, VOL. 1 & 2 BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC) WITH CALIFORNIA AMENDMENTS).
3. 2019 CALIFORNIA ELECTRICAL CODE (CEC) (CCR, TITLE 24, PART 3 BASED ON IT HE 2017 NATIONAL ELECTRICAL CODE (NEC) WITH CALIFORNIA AMENDMENTS).
4. 2019 CALIFORNIA MECHANICAL CODE (CMC) (CCR, TITLE 24, PART 4 BASED ON THE 2018 UNIFORM MECHANICAL CODE (UMC) WITH CALIFORNIA AMENDMENTS).
5. 2019 CALIFORNIA PLUMBING CODE (CPC) (CCR, TITLE 24, PART 5 BASED ON THE 2018 UNIFORM PLUMBING CODE (UPC) WITH CALIFORNIA AMENDMENTS).
6. 2019 CALIFORNIA ENERGY CODE (CCR, TITLE 24, PART 6).
7. 2019 CALIFORNIA FIRE CODE (CFC) (CCR, TITLE 24, PART 9 BASED ON THE 2018 INTERNATIONAL FIRE CODE (IFC) WITH CALIFORNIA AMENDMENTS).
8. 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE (CCR, TITLE 24, PART 11).
9. 2019 CALIFORNIA REFERENCED STANDARDS CODE (CCR, TITLE 24, PART 12).
10. TITLE 19 (CCR), PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.
11. NATIONAL FIRE ALARM CODE (NFPA 72) 2016.
12. COUNTY OF SANTA CRUZ ORDINANCES, CODES, AND REGULATIONS.

STANDARDS:

1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
2. ELECTRONIC INDUSTRIES ASSOCIATION (EIA).
3. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE).
4. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA).
5. NATIONAL ELECTRICAL TESTING ASSOCIATION (NETA).
6. UNDERWRITER LABORATORIES (UL).
7. CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ACT STANDARDS (CALOSHA).

SHEET INDEX

E0.1 SYMBOLS, ABBREVIATIONS, CODES, STANDARDS, NOTES & SHEET INDEX.
E1.1 ELECTRICAL SERVICE UNDERGROUND & PANELBOARD SCHEDULES.
E2.1 OVERALL SITE PLAN.
E3.1 ELECTRICAL DEMOLITION & POWER PLAN.
E4.1 ELECTRICAL SPECIFICATIONS.

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REVISIONS	DATE
1 BID DRAWING	07/15/22
2 BID RFI	08/09/22

REGISTERED PROFESSIONAL ENGINEER No. M33543 07 SEPT. 30, 2022 ELECTRICAL STATE OF CALIFORNIA

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2
SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE CA 95073

SYMBOLS, ABBREVIATIONS, DEMOLITION NOTES, CODES, STANDARDS & SHEET INDEX

DATE	7/14/2022
DRAWN	CSED
JOB	2022-0039
SHEET	E0.1

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PANELBOARD SCHEDULE

2 (E) PANEL BH

Voltage:	277/480V,3ø	Bussing:	100A
Wire:	4W	Feed:	BOTTOM
Type:	NEMA 1	Mounting:	SURFACE
Mains:	M.L.O.	A.I.C.	10,000

Note	Load	A	B	C	Bkr	Ck	Ck	Bkr	A	B	C	Load	Note
1	B-1,B-2	2000				1	2		3033			HWP-2	1
1	B-1,B-2		2000		30/3	3	4	30/3		3033		HWP-2	1
1	B-1,B-2			2000		5	6				3033	HWP-2	1
1	HWP-1	3033				7	8					SPARE	
1	HWP-1		3033		30/3	9	10	30/3				SPARE	
1	HWP-1			3033		11	12					SPARE	
1	BP-1	933				13	14		933			BP-2	1
1	BP-1		933		20/3	15	16	20/3		933		BP-2	1
1	BP-1			933		17	18				933	BP-2	1
	SPARE					19	20					SPARE	
	SPARE				20/3	21	22	15/3				SPARE	
	SPARE					23	24					SPARE	
	SPARE					25	26	20/1	120			WATER SOFTENER WS-1	3
	SPARE				15/3	27	28	20/1		120		WATER SOFTENER WS-2	3
	SPARE					29	30	-				SPACE ONLY	
	SPACE ONLY				-	31	32	-				SPACE ONLY	
	SPACE ONLY				-	33	34	-				SPACE ONLY	
	SPACE ONLY				-	35	36	-				SPACE ONLY	
	SPACE ONLY				-	37	38	-				SPACE ONLY	
	SPACE ONLY				-	39	40	-				SPACE ONLY	
	SPACE ONLY				-	41	42	-				SPACE ONLY	
		5966	5966	5966					4086	4086	3966		

1. CONNECT CIRCUITS TO SPARE BREAKER.
2. PROVIDE A NEW TYPED PANELBOARD DIRECTORY.
3. INSTALL NEW BREAKER AND CONNECT CIRCUIT.

KVA Phase A	10.1
KVA Phase B	10.1
KVA Phase C	9.9
Total Connected Load KVA	30.0
Total Load Amperes	36

2 (E) PANEL EP

Voltage:	120/208V,3ø	Bussing:	225A
Wire:	4W	Feed:	TOP
Type:	NEMA 1	Mounting:	SURFACE
Mains:	M.L.O.	A.I.C.	10000A

Note	Load	A	B	C	Bkr	Ck	Ck	Bkr	A	B	C	Load	Note
	EF-13	400				1	2		400			EF-14	
	EF-13		400		15/3	3	4	15/3		400		EF-14	
	EF-13			400		5	6				400	EF-14	
1	SPARE					7	8					SPARE	1
1	SPARE				15/3	9	10	15/3				SPARE	1
1	SPARE					11	12					SPARE	1
	DWHP-4 RETURN	400				13	14		400			DWHP-6 RETURN	
	DWHP-4 RETURN		400		15/3	15	16	15/3		400		DWHP-6 RETURN	
	DWHP-4 RETURN			400		17	18				400	DWHP-6 RETURN	
1	SPARE					19	20					SPARE	1
1	SPARE				20/3	21	22	40/3				SPARE	1
1	SPARE					23	24					SPARE	1
	DWHP-4 SUPPLY	1300				25	26		1300			DWH-6 SUPPLY	
	DWHP-4 SUPPLY		1300		20/3	27	28	20/3		1300		DWH-6 SUPPLY	
	DWHP-4 SUPPLY			1300		29	30				1300	DWH-6 SUPPLY	
1	SPARE					31	32					SPARE	1
1	SPARE				15/3	33	34	15/3				SPARE	1
1	SPARE					35	36					SPARE	1
	SURGE PROTECTOR					37	38	-				SPACE ONLY	
	SURGE PROTECTOR				40/3	39	40	60/2				SECURITY UPS	
	SURGE PROTECTOR					41	42					SECURITY UPS	
		2100	2100	2100					2100	2100	2100		

1. DISCONNECT AND SALVAGE SPARE BREAKER.
2. PROVIDE A NEW TYPED PANELBOARD DIRECTORY.

KVA Phase A	4.2
KVA Phase B	4.2
KVA Phase C	4.2
Total Connected Load KVA	12.6
Total Load Amperes	35

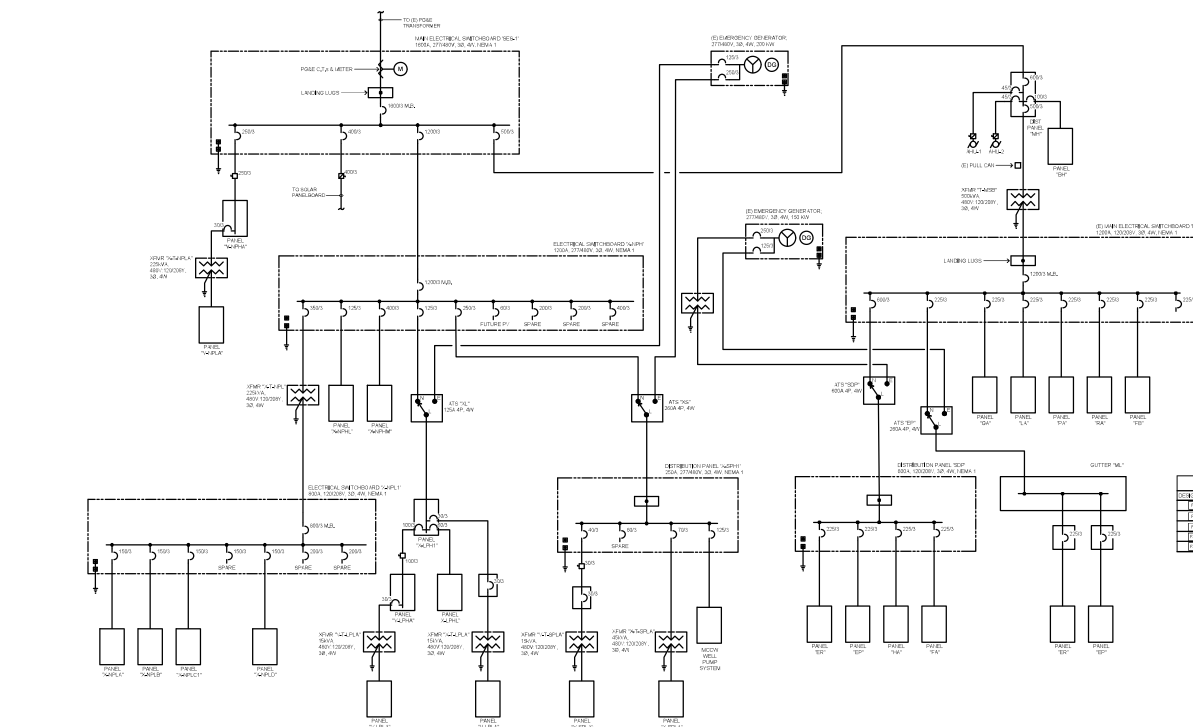
(E) PANEL ER

Voltage:	120/208V,3ø	Bussing:	225A
Wire:	4W	Feed:	TOP
Type:	NEMA 1	Mounting:	SURFACE
Mains:	M.L.O.	A.I.C.	10000A

Note	Load	A	B	C	Bkr	Ck	Ck	Bkr	A	B	C	Load	Note
	EF-3	500			20/1	1	2	20/1	1000			TOP	
	EF-4		500		20/1	3	4	20/1				SPARE	1
	ROOF			1000	20/1	5	6	20/1			600	199	
	EF-6	400			20/1	7	8	20/1	1000			WH-1	2
	EF-7		400		20/1	9	10	20/1		1000		WH-2	
	ROOF			1000	20/1	11	12	20/1			360	HXWH-1, HXWH-2	2
	WHB-2	1000				13	14		567			HXP-1	3
	WHB-2		1000		15/3	15	16	15/3		567		HXP-1	3
	WHB-2			1000		17	18				567	HXP-1	3
	WHB-1	1000				19	20		6000			LEACH FIELD PUMP	
	WHB-2		1000		15/3	21	22	50/3		6000		LEACH FIELD PUMP	
	WHB-3			1000		23	24				6000	LEACH FIELD PUMP	
	EF-10	1400				25	26		567			EF-17	
	EF-10		1400		40/3	27	28	15/3		567		EF-17	
	EF-10			1400		29	30				567	EF-17	
	CONTROL WHB1 & WHB2				20/1	31	32		567			HXP-2	3
	FREEZER		2700			33	34	15/3		567		HXP-2	3
	FREEZER			2700	40/3	35	36				567	HXP-2	3
	FREEZER	2700				37	38	20/1				SPARE	
	SPARE		120		20/1	39	40	30/2				VG-3	
	SPARE			120	15/1	41	42					VG-3	
		7000	7120	8220					9701	8701	8661		

1. DISCONNECT CIRCUIT FOR NEW CONTROLLER.
2. CONNECT NEW CIRCUIT TO EXISTING BREAKER.
3. DEMOLISH EXISTING BREAKER AND INSTALL NEW COMPONENT.

KVA Phase A	16.7
KVA Phase B	15.8
KVA Phase C	16.9
Total Connected Load KVA	49.4
Total Load Amperes	137



1 SINGLE LINE DIAGRAM - FOR REFERENCE ONLY
NO SCALE

SINGLE LINE DIAGRAM LEGEND

- (DEMOLISH)
- (EXISTING)
- (NEW)
- (E) FLOOR/PAD MOUNTED EQUIPMENT
- (N) FLOOR/PAD MOUNTED EQUIPMENT

FEEDER SCHEDULE

DESIGNATION	AMPACITY	CONDUIT & CONDUCTORS SIZES
F303	70	1 1/4" C., 3 #4 & 1 #8 GND.
F306	150	1 1/2" C., 3 #1/0 & 1 #6 GND.
F312	400	3 1/2" C., 3 #500kcm & 1 #2 GND.
F312P	400	(2) SETS OF 2" C., EACH W/3 #3/0 & 1 #2 GND (PARALLEL).
F313C	600	(E) (2) 3 1/2" C., EACH W/ NEW 3 #350kcm & 1 #1/0 GND (PARALLEL).

REGISTERED PROFESSIONAL ENGINEER ELDRIDGE O. BELL No. E17789 EXP. 6/30/26 ELECTRICAL STATE OF CALIFORNIA

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REVISIONS	DATE
1 BID DRAWINGS	11/15/22
2 BID REV	03/29/24

REGISTERED PROFESSIONAL ENGINEER SEAN L. RING No. M33543 EXP. SEPT. 30, 2022 MECHANICAL STATE OF CALIFORNIA

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90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

ELECTRICAL SINGLE LINE DIAGRAM & PANELBOARD SCHEDULES

DATE	7/14/2022
SCALE	
DRAWN	CADD
JOB	20220030
SHEET	E1.1

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GENERAL DEMOLITION NOTES

A. CONTRACTOR SHALL FIELD VERIFY EXTENT OF ELECTRICAL DEMOLITION AND QUANTITIES OF ELECTRICAL TO BE REMOVED AS DICTATED BY THE REQUIREMENTS OF THE PROJECT.

B. REMOVAL SHALL INCLUDE WIRING, RACEWAY, BOXES, SWITCHES, LIGHT FIXTURES, ETC. AS INDICATED ON THE PLANS AND AS REQUIRED BY THESE DEMOLITION NOTES.

C. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE CONCEALED IN EXISTING REMAINING WALLS MAY BE ABANDONED IN PLACE, REMOVE WIRING FROM CONDUIT.

D. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE EXPOSED SHALL BE REMOVED.

E. WHERE REMOVAL OF EQUIPMENT OR WIRING IS INDICATED, IT SHALL INCLUDE ALL ASSOCIATED WIRING BACK TO LAST ACTIVE REMAINING OUTLET, DEVICE, FIXTURE OR PANEL.

F. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL REMAINING ACTIVE CIRCUITS, DEVICES, OUTLETS, LIGHT FIXTURES, ETC. HAVE NOT BEEN DISCONNECTED OR MADE INOPERATIVE DURING DEMOLITION. ELECTRICAL CONTRACTOR SHALL RESTORE ALL INTERRUPTED OR DISCONNECTED CIRCUITS TO OPERATION.

G. ELECTRICAL CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL REMOVED ELECTRICAL EQUIPMENT AND MATERIAL.

H. NO REMOVED EQUIPMENT OR MATERIAL SHALL BE REUSED AS PART OF NEW WORK, U.O.N.

I. EXISTING REMAINING CONCEALED RACEWAYS MAY BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATIONS FOR NEW WORK.

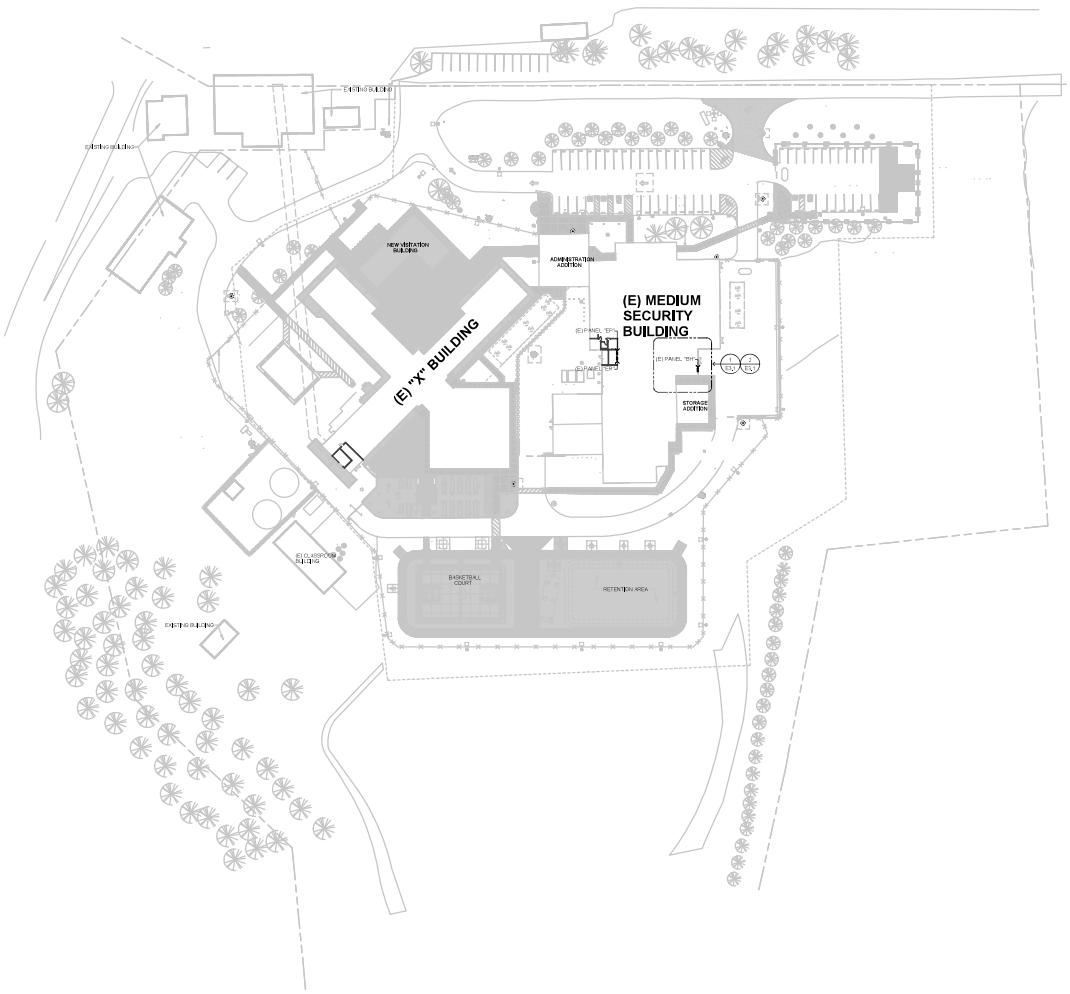
J. EXISTING FLUSH OUTLETS MAY BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATIONS FOR NEW WORK, MEET THE REQUIREMENTS OF THE CURRENT CEC, FOR VOLUME AND CONDUCTOR FILL, AND CONDUCTOR LENGTHS FOR THE NEW WORK.

K. FLUSH OUTLET BOXES IN EXISTING WALLS TO REMAIN MAY BE ABANDONED IN PLACE, REMOVE DEVICES AND WIRING, PLUG OPENING AND PROVIDE AND INSTALL A BLANK DEVICE PLATE.

L. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.

M. WHERE TELEPHONE, COMPUTER DATA, FIBER OPTICS, FIRE ALARM OR OTHER COMMUNICATIONS OUTLETS OR WIRING IS TO BE DEMOLISHED IT SHALL BE REMOVED BACK TO THE NEXT TERMINAL POINT. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER OR HIS REPRESENTATIVE TO HAVE EQUIPMENT AND WIRING DESIGNATED FOR REMOVAL OR PRESERVATION PRIOR TO REMOVAL OF OUTLET BOXES. CONSULT OWNERS REPRESENTATIVE BY ELECTRICAL CONTRACTOR.

N. COORDINATE WITH OWNER PRIOR TO START OF DEMOLITION TO MINIMIZE POWER INTERRUPTIONS. WORK MAY HAVE TO OCCUR DURING NON-REGULAR BUSINESS HOURS. COORDINATION WITH THE OWNER ONE WEEK PRIOR TO PLANNED POWER INTERRUPTIONS.



SCALE: 1"=40'-0"

NORTH

AXIOM CONSULTING ENGINEERS
MONTEREY BAY INC.

Project No. 21-8-W

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REVISIONS	DATE
1 ISSUED FOR BID	02/01/22
2 ASI #1	03/29/22

REGISTERED PROFESSIONAL ENGINEER
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No. M33543
09 SEPT. 30, 2022
ELECTRICAL
STATE OF CALIFORNIA

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Checked by: T. Koch
AE Project #: 1000-000

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95076

OVERALL SITE PLAN

DATE: 7/14/2022
SCALE: 1"=40'-0"
DRAWN BY: CSED
JOB #: 20200939
SHEET: E2.1

DocuSign Envelope ID: DDB520D0-7A34-47D7-9F7D-76ABBB3C05EC

SHEET NOTES

1. 120V WATER HEATER CONTROL UNIT.
2. 2HP, 460V, 3Ø PUMP.
3. 72HP, 460V 3Ø HOT WATER PUMP.
4. 480V, 3Ø HOT WATER PUMP DRIVE.
5. 1HP, 208V, 3Ø PUMP.
6. 480V, 30A, 3Ø GAS FIRED BOILER.
7. CONTRACTOR SHALL SALVAGE BOILER FOR REPLACEMENT.
8. CONTRACTOR SHALL SALVAGE CIRCUIT FOR NEW BOILER CONTROL.
9. CONTRACTOR SHALL RECONNECT TO SALVAGED CIRCUIT.
10. CONTRACTOR SHALL RELOCATE BOILER PUMPS. SEE DETAIL.
11. CONTRACTOR SHALL DEMOLISH PER GENERAL DEMOLITION NOTES.
12. 120V, 3Ø, 1Ø, A, WATER SOFTENER.

BRANCH CIRCUIT CONDUCTOR SIZING TABLE

AWG	CIRCUIT LENGTH	CIRCUIT LENGTH	REQUIREMENT
20/120	0'-50'	0'-50'	3Ø C., 2#10 & 1#10 GND.
20/120	51'-100'	51'-100'	3Ø C., 2#8 & 1#10 GND.
20/277	101'-200'	101'-200'	3Ø C., 2#10 & 1#10 GND.
20/277	201'-300'	201'-300'	3Ø C., 2#8 & 1#10 GND.

NOTE:
CONTRACTOR SHALL SIZE BRANCH CIRCUIT CONDUCTORS PER THE TABLE ABOVE AS DETERMINED BY THE CIRCUIT CONDUCTOR LENGTH. LUCK, CONTRACTOR SHALL SIZE UP TO #2 AWG WITH TERMINATION BOX FOR DEVICE CONNECTION IF NECESSARY.

GENERAL DEMOLITION NOTES

A. CONTRACTOR SHALL FIELD VERIFY EXTENT OF ELECTRICAL DEMOLITION AND QUANTITIES OF ELECTRICAL TO BE REMOVED AS DICTATED BY THE REQUIREMENTS OF THE PROJECT.

B. REMOVAL SHALL INCLUDE WIRING, RACEWAY, BOXES, SWITCHES, LIGHT FIXTURES, ETC., AS INDICATED ON THE PLANS AND AS REQUIRED BY THESE DEMOLITION NOTES.

C. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE CONCEALED IN EXISTING REMAINING WALLS MAY BE ABANDONED IN PLACE, REMOVE WIRING FROM CONDUIT.

D. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE EXPOSED SHALL BE REMOVED.

E. WHERE REMOVAL OF EQUIPMENT OR WIRING IS INDICATED, IT SHALL INCLUDE ALL ASSOCIATED WIRING BACK TO LAST ACTIVE REMAINING OUTLET, DEVICE, FIXTURE OR PANEL.

F. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL REMAINING ACTIVE CIRCUITS, DEVICES, OUTLETS, LIGHT FIXTURES, ETC., HAVE NOT BEEN DISCONNECTED OR MADE INOPERATIVE DURING DEMOLITION. ELECTRICAL CONTRACTOR SHALL RESTORE ALL INTERRUPTED OR DISCONNECTED CIRCUITS TO OPERATION.

G. ELECTRICAL CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL REMOVED ELECTRICAL EQUIPMENT AND MATERIAL.

H. NO REMOVED EQUIPMENT OR MATERIAL SHALL BE REUSED AS PART OF NEW WORK, U.O.N.

I. EXISTING REMAINING CONCEALED RACEWAY SHALL BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK.

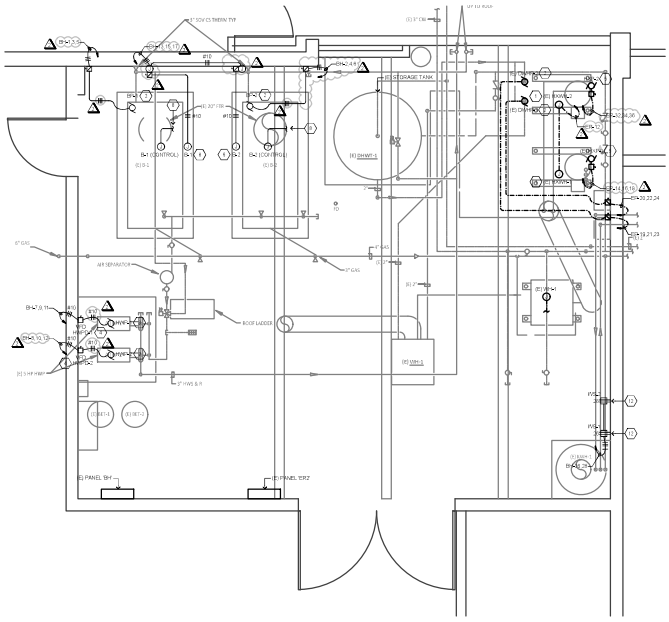
J. EXISTING FLUSH OUTLETS MAY BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK, MEET THE REQUIREMENTS OF THE CURRENT CEC, FOR VOLUME AND CONDUCTOR DEPTH LOCATION SHOWN FOR THE NEW WORK.

K. FLUSH OUTLET BOXES IN EXISTING WALLS TO REMAIN MAY BE ABANDONED IN PLACE, REMOVE DEVICES AND WIRING, PLUG OPENING AND PROVIDE AND INSTALL A BLANK DEVICE PLATE.

L. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.

M. WHERE TELEPHONE, COMPUTER DATA, FIBER OPTICS, FIRE ALARM OR OTHER COMMUNICATION OUTLETS OR WIRING IS TO BE DEMOLISHED IT SHALL BE REMOVED BACK TO THE NEAREST TERMINAL POINT. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER OR OWNERS REPRESENTATIVE TO HAVE EQUIPMENT AND WIRING DESIGNATED FOR REMOVAL OR PRESERVATION PRIOR TO REMOVAL OF OUTLET BOXES. CONTACT OWNERS REPRESENTATIVE BY ELECTRICAL CONTRACTOR.

N. COORDINATE WITH OWNER PRIOR TO START OF DEMOLITION TO MINIMIZE POWER INTERRUPTIONS. WORK MAY HAVE TO OCCUR DURING NON-REGULAR BUSINESS HOURS. COORDINATION MEETING WITH OWNER ONE WEEK PRIOR TO PLANNED POWER INTERRUPTIONS.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UP TO ROOF
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(E) 2

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SECTION 26 05 73

GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 Description of Work
A. Provide and install all required equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 Submittals
A. As specified in Division 1. Submit to the architect shop drawings, manufacturer's data and catalog cuts, complete with dimensions, weights, electrical characteristics, and such other pertinent information as requested including manufacturer's descriptive literature of catalogued products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Unless written approval is first given, fabrication, or delivery of the items to the job site.
B. Substitutions of products will not be reviewed or approved prior to awarding of the Contract.
C. Substitutions shall be proven to the architect or Engineer to be equal or superior to the specified product. Architect's decision is final. The Contractor shall pay all costs incurred by the architect and Engineer in reviewing and processing any proposed substitution whether or not a proposed substitution is accepted.
D. If a proposed substitution is accepted, the contractor shall furnish the specified product at no increase in contract price.
E. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are needed of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

1.03 Quality assurance
A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions of the following applicable codes:
1. California Electrical Code (CEC)
2. Occupational Safety and Health Act (OSHA) standards.
3. Underwriters Laboratories (UL) standards.
4. Electrical Contractor shall possess a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of the contract and be maintained throughout the duration of the contract.
B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall govern.
C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers association (NEMA).
D. Underwriters Laboratories (UL) listing is required for all equipment and materials where such listing is available. Provide UL labels on equipment. Provide service contractor labels for all equipment required by the NEC to have such labels.
E. The electrical contractor shall guarantee all work and material installed under this contract for a period of one (1) year from date of acceptance by owner.
F. All tools and materials covered by the specifications shall be subject to inspection at any and all times by representatives of the Owner. Any defective or improper material shall be replaced and approved by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises, if installed it will be uninstalled, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.04 Contract Documents
A. Drawings: The Electrical Drawings shall generally be general layout of the completed construction. Do not scale drawings for exact locations. Contractor shall be responsible for determining the approximate sizes dimensions, and fit by inspection with the Architect prior to installation.
2. The general arrangement and choice of routing, conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the contractor and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions and by the contractor's ability to fit his work into the building and to connect it to the equipment furnished in accordance to manufacturer's data. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the drawings due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.
3. Drawings are diagrammatic and shall not be scaled nor considered as whole. The contractor shall report any apparent discrepancies in the drawings prior to submitting bids.
4. The contractor shall be fully responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be fully responsible for knowledge of all existing conditions affecting the work and no allowance for ignorance of such allowance shall be made for any value expense due to failure to make such examination.

1.05 Contract Submittals
A. Materials: Provide materials for equipment where materials are specified in the equipment specifications or are specified in Division 1.

1.06 Coordination
A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.
B. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of the work.
C. Where connections must be made to existing installations, properly schedule all the required work, including the prior shutdown periods.
D. When two trades join together or are near, make certain that no electrical work is omitted.

1.07 Job Conditions
A. Operations: Perform all work in compliance with Division 1.
1. Keep the conduct and duration of power shutdowns periods to a minimum.
2. Schedule all power shutdowns with the Owner's representative in advance of construction schedule.
3. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities.
4. Carry out shutdowns only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 14 days prior to date of interruption.
B. Coordination: Coordinate work with other trades and as specified in the specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power from the nearest on site source. Energy costs shall be paid for by the Owner.

1.08 Safety and Indemnity
A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement and apply continually and not be limited to normal working hours. The contractor shall provide and maintain safeguards, safety devices and protective equipment, erect barricades, post danger signs, warning signs, lights, etc. to prevent accidental injury to people or damage to property.
B. The Contractor performing work under the Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damages arising out of or alleged to arise out of the performance of the work described herein or under the Division of the Specifications, or any injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under the Division of the Specifications, and from the Contractor's negligence or the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their consultants, officers, agents and employees.
C. If a work area is encountered that contains hazardous materials, the contractor is advised to coordinate with the owner and/or document consultant for abatement of hazardous material by the Owner's Representative. "Hazardous material" means any toxic substance regulated or controlled by CEQA, EPA, State of California or local rules, regulations and laws. Nothing herein shall be construed or interpreted to require the Contractor to perform any work regarding hazardous materials abatement, removal, or discovery of hazardous materials.

1.09 Air Flash
A. The contractor shall install a clearly visible arc flash warning in the inside door of all panelboards and industrial control panels, as well as to the front of all switchboards and motor control centers that are a part of this project.
B. The warning shall have the following wording: Box 1 "WARNING" (in large letters), Box 2 "Arc Flash Hazard" (in large letters), Box 3 "Appropriate Personal Protective Equipment and Tools required when working on this equipment".

1.10 All items and enclosures for emergency circuits shall be permanently marked with orange marker and spray painted cards.

PART 2 – PRODUCTS

2.01 Nameplates
A. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be minimum plastic 1/8 inch thick, white with black letters, 1 inch high. Use 1/2 inch high letters for main equipment. Use 1/4 inch high lettering and engraves on the case. Dimensions are 1 inch minimum by 3 inches and as otherwise noted. Where not otherwise specified, lettering shall be a minimum of 1/8 inch high normal block style. Engraver complies with the assumption indicated on the Drawings and, if not in conformity, with the equipment name. Security fasten nameplates in place using tear resistant steel or brass screws.

2.02 Finish requirements
A. Finish requirements for each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the architect.
B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 – EXECUTION

3.01 Workmanship
A. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the NEC, the Manufacturer's Instructions, and the requirements of Section 01 33 00 "Submittals". Workmanship of the contractor shall be first class in every respect.

3.02 Equipment Installation
A. Provide the required sockets, hubs and anchors, and securely attach all equipment and materials to the building structure.
B. Do all the cutting and patching necessary for the proper installation work and repair any damage done.
C. Provide minimum all electrical equipment including conduits over 2 inches in diameter, shall be braced or anchored to resist a horizontal force acting in any direction as per CBC Section 1613.6, Title 24, part 1 and ASCE/SEI-7, sections 13.1 and 13.6 and table 13.5-1.
D. Structural steel – All new structural members or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of the work. Provide structural calculations and drawings for approval. Where structural steel is required, the contractor shall first submit shop drawings to the Architect for review for approval, and then proceed with fabrication. Submit sketch showing location of other and proposed cuts, cores, or hole and/or location for approval.

3.03 Field Tests
A. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate an ready for service.
B. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

3.04 Records
A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" locations. After completion of the work, the Contractor shall carefully mark the work in red ink on the Drawing Sheets to show the actual locations of all equipment, conduits, and other work. Drawings shall be delivered to the architect within two (2) days of completion of construction.

3.05 Clean Up
A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the architect.

3.06 Mechanical and Plumbing Electrical Work
A. The requirements for electrical power and/or devices for all mechanical and plumbing equipment supplied and/or installed under the Mechanical and Plumbing Contract shall be coordinated and verified with the following:
1. Mechanical and Plumbing Drawings
2. Mechanical and Plumbing sections of these Specifications
B. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:
1. Line voltage controls and wiring
2. Disconnect switches
3. Manual line voltage motors
C. All line voltage control wiring for Mechanical and Plumbing equipment shall be installed in conformance with the requirements and connections of all line voltage conduit, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.

SECTION 26 05 26

GROUNDING

PART 2 – EXECUTION

2.1 Grounding and Bonding
A. Grounding and bonding shall be accomplished for radio and local authorities.
B. All electrical equipment shall be grounded, including but not limited to, panel boards, terminal cabinets and motor boxes.
C. Ground rods and grounding conductors shall be connected to form under bonds by means of a copper ground wire, connecting in a corner in the back of the box.
D. A green insulated copper ground wire, sized to comply with codes, shall be installed in all conduit runs.
E. All metal parts of pull boxes shall be grounded per code requirements.
F. All ground conductors shall be green insulated copper.

SECTION 26 05 43

CONDUITS, RACEWAYS AND FITTINGS

PART 2 – EXECUTION

2.01 Conduit, Raceways and Fitting Installation
A. For conduit runs exposed to weather provide rigid metal (GRS).
B. For conduits run underground, or in cavity or masonry block wall and under concrete slabs, install minimum ¾" size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground to above grade, provide rigid steel elbows and rigid steel conduit for the last 10 feet.
C. For conduit runs concealed in stud or wood framed walls or in ceiling spaces or exposed in interior spaces above or flow over the finished floor, install EMT.
D. Provide metal conduit shall be installed for the connection of recessed lighting fixtures and center connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for connections to motors.
E. The minimum size conduit shall be ¾" unless indicated otherwise on the Drawings.
F. Installation shall comply with the CEC.
G. Conduit runs shall be parallel with the lines of the angles of all of the bends and offset shall not exceed 30 degrees.
H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.
1. Exposed Conduits: Support exposed conduit within three feet of any equipment or device and within three feet of any junction box, outlet box, or fitting and at intervals not exceeding ten feet. Support exposed conduits fastened to the surface of the concrete structure for crowded changes, or with channels. Use conduit spacers with movable clamps.
I. Conduits attached to walls or columns shall be on continuous or parallel and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.
J. Provide conduit supports, hangers, and fittings to properly support and rigidly.
1. Support all conduits within three feet of any junction box, outlet box, or fitting.
2. Support conduit runs on shelves with Unistrut Department, or approved equal, channels and straps.
3. Maximum Span: Provide in accordance with NEC paragraphs 370.6 and 370.10(2).
K. Where PVC conduit transitions from underground to above grade, provide rigid steel 90's with rigid steel conduit for the last 10 feet. Provide PVC coated and taper and extend minimum 17" above grade. Provide a pulling pull cord in each empty raceway.
L. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.
M. Stage all underground raceways to provide drainage, for example, if pipe conduit from equipment to underground is heading to the pull box or manhole is sloped inside the building.
N. Conduits shall be blown out and swabbed prior to pulling wires.

SECTION 26 05 19

LOW VOLTAGE WIRE AND CABLE

PART 2 – PRODUCTS

2.01 Conductors
A. Conductors shall be copper, type THWN/THHN/MTW rod and gauge as required, 98%, 600 volt insulation.
B. Conductors shall be stranded copper.
C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.
D. All conductors used on this Project shall be of the same type and conductor material.

2.02 Terminations
A. Manufacturer: Terminals as manufactured by T&B, Burndy or equal.
B. Wire Terminations: Stranded conductors shall be terminated in clamping type terminations which serve to contain all the strands of the conductor. Cutting of a stranded conductor to meet a screw type terminal is not allowed. For screw type terminations, use a flat type cold-weld termination on the stranded conductor. Use only a cold-weld terminal for the flat terminals selected.
C. Ear Holes: Ear Holes shall be sized to match the size of the screw to which used.

2.03 Taps
A. Taps used for terminations and splice packing shall be compatible with the insulation and jacket of the conductor and be of plastic material.

PART 3 – EXECUTION

3.01 Cable Installation
A. Cross Encumbrances: Clean all raceways prior to installation of cables as specified in Section 26 05 43.
B. Do not use lubricant and Pulings.
C. All wiring and splicing for voltage wiring shall be installed in conduit, 12 G.N.
D. Pulling Tension: Do not exceed the maximum pulling tension as specified by the cable manufacturer unless specifically approved by the Electrical Engineer.
E. All branch circuit wiring shall be free from splices in ceiling spaces, walls, below floors or in crawl spaces unless noted otherwise.

3.02 Cable Terminations and Splices
A. Splices: UL listed materials.
B. Terminations: Shall comply with the following:
1. Make up and form cable and secure terminals to minimum cable stress and stress on device being terminated to.
2. Remove inside from conductor prior to inserting in-inside breaking compound filled terminal.

3.03 Circuit and Conductor Identification
A. Color Coding: Provide color coding for all circuit conductors. Installation color shall be white for neutrals and green for grounding conductors. Conductor colors shall be as follows:

Phase	120/208	277/480
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

B. Color coding shall be for conductor insulation for all conductors #8 AWG and smaller. For larger conductors, color shall be either in the insulation or by colored plastic tape applied at every accessible location within the raceway or enclosure.
C. Circuit Identification: All underground distribution and service circuits shall be provided with plastic identification tags in each secondary box and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) serve of by the circuit.

3.04 Field Tests
A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show no insulation resistance between phase conductors and ground of not less than the requirements of the CEC. All circuits shall be tested for proper neutral connections.
B. Insulation Resistance Tests: perform insulation resistance tests on circuits with #8 AWG and larger conductors using a megohmmeter. Test the insulation of the circuit with the switch in the "on" position before all equipment has been connected. Test the insulation with a 500 Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 5 megohms or more. Submit results for review.
C. Contractor shall hanger all termination of feeders/circuits terminations where required per CEC and manufacturer labeling requirements at point of connection.

SECTION 26 05 33

OUTLET, JUNCTION AND PULL BOXES

PART 2 – PRODUCTS

2.01 Outlet boxes, Junction and Pull boxes
A. Standard Outlet Boxes: Galvanized steel, knockout type of size and configuration best suited to the applications indicated on the Drawings. Minimum box size shall be 4 inches square (octagon for use at light fixtures) by 1½ inches deep with steel rings as required. Boxes used with conduit 1" or larger shall be minimum 1" deep.
B. Boxes for Ceiling Installation: Boxes shall be a inches square by 2-1/2 inches deep with steel rings as required. Install at ceiling junction or standard ceiling boxes with steel device covers suitable for the application indicated.
C. Conduit Bodies: Galvanized plated, cast iron alloy. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be sized to facilitate pulling of conductors in the conduit. Provide conduit bodies with covers that are protected to conduit bodies. Crouse-Hinds Form 8 Condulets, Appleton Form 35 Bodies or equal.
D. Sheet Metal Boxes: Use standard outlet or concrete ring boxes wherever possible, otherwise use a minimum 16 gauge galvanized steel outlet. Provide a flat solid or knockout with screw covers secured by screws on galvanized screws to metal junction or outlet boxes. Circle-AW Products, Inc. Model CSB or equal.
E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping cover with flush hand cover retaining screw, press coated.

PART 3 – EXECUTION

3.01 Outlet Boxes
A. General
1. Install boxes that flush mount with building walls, ceilings and floors except in mechanical and electrical rooms where exposed ceiling or where required such as called for on the Drawings.
2. Install metal device covers (plaster rings) on all switch and receptacle wall boxes installed in masonry or stud walls or to flush, suspended or exposed concrete ceilings. Covers shall be of a type to match the adjacent finish.
3. Locate switch and/or boxes on the latch side of doorways.
4. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted.
5. Install boxes in walls or ceilings so that they shall be supported horizontally by at least one stud or metal support member.
6. For outlets located above counters, benches or backsplashes, coordinate locations and mounting heights with the best-suited. Adjust mounting heights to agree with required locations for equipment served.
7. Boxes shall be set so that the front face even of the outlet boxes shall not exceed 100 square inches per 100 square feet of wall area.
B. Supports
1. Outlet Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Install boxes in masonry walls or concrete walls in a manner approved or bolt and plaster construction shall be secured to it by gang-nailed channel bars attached to some ceiling members.
3. Plaster outlet boxes installed in suspended ceilings supporting acoustical tile or panels shall be supported directly from the structure above where practical or secured lighting fixture are to be installed on the box.
4. Install boxes in the ceiling cavities of suspended ceilings supporting acoustical tile or panels shall be supported directly from the structure above.
5. Outlet and/or junction boxes shall not be supported by pipe or fixture hanger wires at any location.

7.02 Junction and Pull Boxes
A. General
1. Install junction or pull boxes where required to have bends in conduit runs in not more than 360 degrees to where pulling means that exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.
2. Install junction boxes in accessible locations in concealed spaces above accessible ceilings or exposed in electrical rooms, utility rooms or storage areas.
3. Install metal cover plates ranged on boxes in stud walls or in flushed, suspended or exposed concrete ceilings. Covers shall be of a finish to match wall or ceiling finish.
4. Leave no unused openings in any box. Install closures plugs as required to seal openings.
5. Install junction and outlet boxes and panel in areas of junction box with blank outlet plate.
B. Box Layout
1. Stamp sheets long ceilings having concealed suspension systems shall be located adjacent to lighting fixtures for connection to recessed lighting fixtures.
C. Supports
1. Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be secured to it by gang-nailed channel bars attached to some ceiling members.
3. Boxes installed in suspended ceilings supporting acoustical tile or panels shall be supported directly from the structure above.
4. Boxes installed above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

SECTION 26 27 26

DEVICES WIRING

PART 2 – PRODUCTS

2.01 Receptacles
A. Duplex Receptacles: Shall be heavy duty, high abuse, grounding type.
B. Duplex Receptacles
1. Receptacles shall be specification grade, rated 20 amperes, nonspecific, 2-wire, 125 volts, NEMA 5-20 configuration, with mounting with screw terminals. Color shall be as selected by the Architect.
2. Receptacles shall have surface face, back and side wired.
3. Manufacturer: Hubbell #5352 Series, Leviton #5352 Series.
C. GFCI Receptacles
1. Devices shall be rated 20 amperes, 2-wire, 125 volt, conforming to NEMA 5-20 configuration. Face shall be color compatible. Unit shall have an LED type red indicator light to show when the receptacle is energized. Provide with mounting screws.
2. GFCI receptacles shall meet UL 943 Class A standards with a tripping level of 4-6 mA and a 5 milliamperes current unbalance. Operating ranges shall extend from -40°F to 150°F. Unit shall have minimum voltage protection and shall be current-compensated. No protection against resetters.
3. Manufacturer: Hubbell #GF20_, Leviton Series #7899 Series.

2.02 Switches
A. Switches shall be rated 20 amperes in 120/277 volts ac. Units shall be flush mounted, toggle operating, quiet operating toggle devices. Handle color shall be as selected by the architect. Provide with mounting screws. Provide with ground screw terminals.
B. Toggle switches: Shall be as designed by Pacific Electric Company #7200 Series Watt Stopper TW-400 series for the voltage specified on drawings. Time out shall be adjustable from 5 minutes up to 1½ hours. Unit shall be provided with warning alarm.

2.03 Plates
A. General: Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform with NEMA WD-1, UL 514 and FS 774C-1-18A. Plates on exterior walls shall be weather proof and shall have gasketed covers. Provide stainless steel plates shall be of 304 grade and or non-corrosive and shall have gasketed covers and beveled edges.
B. Blank Plates: Plates shall be plain with beveled edges and shall be color as selected Hubbell.
C. Smoke Seal: Plates shall be 302 stainless steel with beveled edges and shall be manufactured from No. 4-40 alloy having a beveled or stainless finish.
D. Plates: Plates shall be same as installed in two covers with gaskets so as to be non-corrosive or weatherproof.
E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction.

PART 3 – EXECUTION

3.01 Installation of Wiring Devices
A. Interior Locations: In finished walls, install each device in a flush-mounted box with sections as required to keep the device mounting plate level with the surface of the finished wall. Do not install devices in a manner that will cause a gap between the plate and the wall.
B. Mounting Heights: Adjust heights so that the front edge of the box shall not be farther back than the finished wall plus than 1/4 inch. Adjust heights so that they do not project beyond the finished wall plus than 1/4 inch. Unless noted otherwise:
1. Receptacles: 15 inches from finished floor to bottom of box unless otherwise noted on the drawings.
2. Toggle Switches: 48 inches from finished floor to top of box.
C. Receptacles
1. Install receptacles in spaces using grounding conductors, not in place as cover contact.
2. Install receptacles with connections spliced to the branch circuit wiring in such a way that removal of the receptacle will not disrupt circuit continuity and break circuit and power will not be lost to other receptacles in the same circuit.

3.02 Installation of Wall Plates
A. General: Plates shall match the style of the device and shall be plastic within 1/1 feet of the vertical or horizontal.
B. Interior Locations, Finished Walls: Install non-metallic plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use plates on uneven surfaces.
C. Interior Locations, Unfinished Walls: Install straight-edged or cast metal cover plates.
D. Exterior Locations: Install cast metal plates with gaskets on wiring devices in such a manner as to provide a tight weatherproof enclosure. Covers shall match box type. Cover shall be Lockwood outdoor cast-metal "Cover" type.
E. Install blank plates on all junction and outlet boxes.
F. Labeling: All switch and receptacle plates shall be labeled on the top portion of the plate with the panelboard and circuit number serving that device. Lettering shall be 1/8" minimum high, black color, on clear Mylar tape.

2.03 Tests
A. Receptacles
1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral conditions.

SECTION 26 28 16

CIRCUIT BREAKERS

PART 2 – PRODUCTS

2.01 Circuit Breaker: Each circuit breaker shall consist of the following:
A. Molded case breaker with an over center toggle mechanism, providing non-hands, quick-make, quick-break, trip free operation. Provide a trip unit containing individual thermal and magnetic trip elements which are by straight adjustment to ensure uniform tripping. Provide trip elements which are by straight adjustment to ensure uniform tripping.
B. Breaker shall be suitable for the system voltage and current shown on the drawings.
C. Each circuit breaker shall have trip indication.
D. Three pole breakers shall be common trip.
E. The circuit breakers shall be constructed to accommodate the supply connections either out of the top or bottom of the breaker and shall be suitable for reverse feeding.
F. Breakers shall be rated as shown on Drawings.
G. Circuit breakers and/or Fused circuit breakers combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations for the use on the equipment in which it is installed. Any series rated combinations need shall be marked on the unit on equipment in which it is installed.
H. Breakers shall be UL listed. Circuit breakers shall have minimum AIC ratings as shown on the drawings.
I. Lugs shall be UL listed for copper and aluminum conductors.
J. Breakers shall be UL listed for applications of continuous at 100% trip ratings.
K. Circuit breakers serving HACR rated loads shall be HACR type. Circuit breakers serving other loads shall be standard type.
L. Breakers indicated as "current limiting" (CL), shall be of the molded case type, Square D or Cutler-Hammer Series C, or GE Series only.

REVISION	DATE
1 ADDENDUM	10/07/22
2 RFI #78	12/21/22

AXIOM ENGINEERS
CONSULTING ENGINEERS
www.axiomengineers.com
No. M33543
09 SEPT 30, 2022
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M33543
Expiration Date: 09/30/2023
STATE OF CALIFORNIA
Electrical Engineer
Mark Anthony Bell
E-13000
Expiration Date: 12/31/2023
STATE OF CALIFORNIA
AURUM CONSULTING ENGINEERING
MONTEREY BAY INC.
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90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 2
SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95076

ELECTRICAL SPECIFICATIONS

Date	7/14/2022
Drawn	CBSD
Job No.	2020039
Sheet	E4.1

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SANTA CRUZ COUNTY - ROUNTREE FACILITY

BOILERS & DHW REPLACEMENT - PHASE 1

90 ROUNTREE LANE
WATSONVILLE, CA. 95073

INDEX OF DRAWINGS

SHT. NO.	SHEET TITLE
T0.1	TITLE SHEET
M70.1	LEGEND, SCHEDULES, SPECIFICATIONS AND NOTES - MECHANICAL & PLUMBING
M71.0	MECHANICAL & PLUMBING ROOF PLAN - NEW & DEMOLITION
M72.1	MECHANICAL & PLUMBING FLOOR PLAN - DEMOLITION
M72.2	MECHANICAL & PLUMBING FLOOR PLAN - NEW
M74.1	MECHANICAL & PLUMBING PIPING DIAGRAMS
E0.1	ELECTRICAL - SIMBOLS, ABBREVIATIONS, CODES, STANDARDS & NOTES
E1.1	ELECTRICAL SINGLE LINE DIAGRAM & PANELBOARD SCHEDULES
E2.1	OVERALL SITE PLAN
E3.1	ELECTRICAL DEMOLITION & POWER PLAN
E4.1	ELECTRICAL SPECIFICATIONS

SCOPE

THIS PROJECT IS THE LIMITED INSTALLATION & IMPROVEMENTS FOR TWO (2) DOMESTIC HOT WATER HEATERS, PUMPS, WATER SOFTNER SYSTEM, & ASSOCIATED DELTA CENTRAL BUILDING MANAGEMENT CONTROLS INTERCONNECTION & PROGRAMMING.

CONTRACTOR SHALL PROVIDE COMPLETE AND OPERATIONAL DHW UNITS AND ALL REQUIRED ELECTRICAL WORK. CONTROL OF NEW EQUIPMENT SHALL BE PER SPECIFIED CONTROLS.

PROJECT INFORMATION

PROJECT: ROUNTREE FACILITY
RADIATOR UNIT REPLACEMENT

LOCATION: 90 ROUNTREE LANE
WATSONVILLE, CA. 95073

LIST OF GOVERNING CODES:

2022 BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24, C.C.R.
2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, C.C.R.
2022 CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24, C.C.R.
2022 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, C.C.R.
2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, C.C.R.
2022 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24, C.C.R.
2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, C.C.R.
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24, C.C.R.
2022 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24, C.C.R.
TITLE 19, C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

ALL SECTION NUMBERS BELOW REFER TO GROUP 1, CHAPTER 4, PART 1, TITLE 24, CCR.

1. ADDITIONAL CONSTRUCTION CHANGES PER SECTION 4-338.
2. INSPECTOR APPROVED BY DSA. INSPECTOR AND CONTINUOUS INSPECTION OF WORK PER SECTION 4-333(b) AND 4-342.
3. TESTS AND TESTING LABORATORY PER SECTION 4-335.
4. SPECIAL INSPECTION PER SECTION 4-333(c).
5. CONTRACTOR SHALL SUBMIT VERIFIED REPORTS PER SECTION 4-336 AND 4-342(c).
6. ADMINISTRATOR OF CONSTRUCTION PER PART 1, TITLE 24, C.F.R. - ENTRUSTS OR ARCHITECT, STRUCTURAL ENGINEER OR SUPERVISORY ENGINEER PER SECTION 4-332(a) AND 4-343.
7. SUBMITTAL PER SECTION 4-336.
8. 4 COPIES PARTS 1, 2, 3, 4, AND 5 OF TITLE 24 SHALL BE KEPT AVAILABLE IN THE FIELD DURING CONSTRUCTION.
9. DSA SHALL BE NOTIFIED OF START OF CONSTRUCTION PER SECTION 4-331.
10. SUPERVISION BY THE DIVISION OF THE STATE ARCHITECT PER SECTION 4-334.

PROJECT DIRECTORY

MECHANICAL ENGINEER

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ELECTRICAL ENGINEER

AURUM CONSULTING ENGINEERS
ED CARTON CT. STE 210
MONTEREY CA 93940
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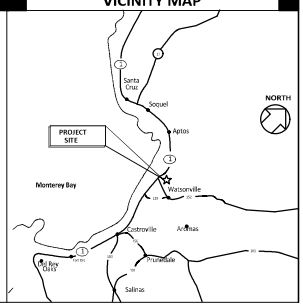
REQUISITE OWNER COORDINATION

1. COORDINATE ALL SYSTEM (HEATING, CONTROLS, POWER, ETC.) SHUTDOWNS WITH COUNTY OWNER REPRESENTATIVES. PROVIDE SHUTDOWN REQUESTS AT LEAST TEN (10) DAYS PRIOR TO SHUTDOWN.
2. CONTRACTOR SHALL COMPLY WITH ALL FACILITY SECURE ACCESS REQUIREMENTS WHILE ON SITE.

VICINITY MAP



REVISIONS	DATE
IFC DRAWINGS	04/05/2021
BID REVISION	08/11/2021

No. M33543
EXP. SEPT. 30, 2024
MECHANICAL
STATE OF CALIFORNIA

GOLDSCHMIDT ENGINEERING + AXIOM engineers

BOISE | CORVALLIS | MEDFORD
NORTHWEST | PAPER | SMITH DALE

CIRCLE SOLUTIONS

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 1
SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

TITLE SHEET

DATE	3/1/2021
SCALE	NONE
DRAWN BY	CADD
JOB	2012.0030

T0.1

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INDIRECT DOMESTIC WATER HEATERS

MARK	LOCATION	DIMENSIONS L x W x H	DOMESTIC HOT WATER: BOILER WATER: FLOW RATE	PRES. DROP	INLET TEMP.	OUTLET TEMP.	HEAT EXCHANGER: FLOW RATE	PRESS. DROP	INLET TEMP.	OUTLET TEMP.	HEAT EXCHANGER: MBH	HEAT & PTN. AREA	ELECTRICAL: V/PH	W	MCA	OPERATING WEIGHT	MAKE & MODEL	REMARKS
HWHX-1	BOILER ROOM	35"x27"x102"	34 GPM	4.91 PSI	115 °F	148 °F	34 GPM	0.39 PSI	60 °F	135 °F	535 MBH	40 SQ FT	120/1	-	-	1,440 LBS	CONLINE: BPH050-2N	1 2 3
HWHX-2	BOILER ROOM	35"x27"x102"	34 GPM	4.91 PSI	115 °F	148 °F	34 GPM	0.39 PSI	60 °F	135 °F	535 MBH	40 SQ FT	120/1	-	-	1,440 LBS	CONLINE: BPH050-2N	1 2 3
			34 GPM	4.91 PSI	180 °F	155 °F	34 GPM	0.39 PSI	60 °F	150 °F	430 MBH							

1. PACKAGED BRAZED PLATE & FRAME TYPE WATER TO WATER HEAT EXCHANGER WITH 2" NPT PIPE CONNECTIONS, DOUBLE WALL PLATE HEAT EXCHANGER CONSTRUCTION, 304 & STAINLESS STEEL PLATES WITH COPPER BRAZE, 316 & STEEL FRAME WITH WHITE POWDER ENAMEL FINISH, & 2" STEEL CHANNEL BASE. DIGITAL TANK THERMOSTAT & BOILER INLET WATER THERMOMETER WITH LCD READOUT DISPLAY, PRESSURE GAUGE, ELECTRONIC 2-WAY CONTROL VALVE, CLEAN OUT PORTS AT INLET/OUTLET PIPING, INLET WYE TYPE SCREENED WATER STRAINERS AT BOILER & DOMESTIC WATER INLETS, ASME PRESSURE/TEMPERATURE RELIEF VALVES, LOCAL ON-OFF CONTROL SWITCH, & INTEGRAL FACTORY CENTRALIZED CONTROL. LCD TOUCH SCREEN DISPLAY WITH CONSOLE LOGIC CONTRACTOR SHALL COORDINATE ONBOARD UNIT BACnet CONTROLS COMPATIBILITY BETWEEN BOILER INTELLIGENT BMS & HEAT EXCHANGER UNIT CONTROLS PRIOR TO ORDERING.
2. UNIT SHALL BE INSULATED WITH FOAM IN PLACE INSULATION PROTECTED BY ENAMELED METAL JACKET, 20 GAUGE MINIMUM THICKNESS.
3. SEE SYMBOLS FOR MOUNTING REQUIREMENTS.

WATER SOFTENERS/BRINE TANKS

MARK	DESCRIPTION	LOCATION	DOWNFLOW CAPACITY AT 1 GPM FLOW: MINIMUM: GRAINS	STANDARD: GRAINS	MAXIMUM: GRAINS	PEAK FLOW: GPM	SERVICE FLOW: GPM	NOM. FLOW: GPM	BRINE TANK DIMENSIONS: DIAMETER	HEIGHT	WIDTH	NET WEIGHT (LBS)	BOWL (CU FT)	PIPE SIZE	VTM	MAKE & MODEL	REMARKS
WS-1	WATER SOFTENER	BOILER RM	-	-	-	85	25 PSI	65	20 PSI	8	67"	21"Ø	1,200	2"	3	CLUGASH CTV-216-FF	1
WS-2	WATER SOFTENER	BOILER RM	-	-	-	85	25 PSI	65	20 PSI	8	67"	21"Ø	1,200	2"	3	CLUGASH CTV-216-FF	1
BT-1	BRINE TANK	BOILER RM	-	-	-	-	-	-	-	-	59"	24"Ø	1,200	-	-	-	1

1. SEE SYMBOLS FOR INSTALLATION REQUIREMENTS.

PROVIDE THE FOLLOWING SYSTEM FEATURES: SEPARATE SAMPLING DRAINS FOR HARD WATER INLET & SOFT WATER OUTLET, SEPARATE PRESSURE GAUGES FOR HARD WATER INLET & SOFT WATER OUTLET, BRINE LEVEL MONITORING INSTRUMENTS, CORROSION RESISTANT BRINE SYSTEM, COMPLETE BRINE CONTROLS, CONTROLLER FOR EACH SOFTENER TANK, HALL EFFECT FLOW SENSOR FOR EACH TANK, SOFTENER TANKS SHALL BE ASME RATED EPOXY LINED CARBON STEEL.

PROGRESSIVE FLOW TANK CONFIGURATION: THE WATER SOFTENER TANKS SHALL BE CONFIGURED SO THAT AS FLOW INCREASES TO 100% OF DESIGN MAXIMUM FOR A SINGLE TANK, THE VALVE FOR THE SECOND TANK IS OPENED SO THAT BOTH TANKS ARE OPERATING SIMULTANEOUSLY. AS FLOW EXCEEDS THE TANK'S USER SPECIFIED VOLUME OF TREATED WATER IS REACHED, IT SHALL BE IMMEDIATELY REGENERATED, RESERVICED, AND RETURNED TO ONLINE STATUS. THE CONTROLLERS ARE CONFIGURED TO RECOGNIZE WHEN ANOTHER CONTROLLER WITHIN A MULTIPLE TANK SYSTEM IS CURRENTLY REGENERATING AND WILL REMAIN IN SERVICE UNTIL THE OTHER TANK HAS COMPLETED THE REGENERATION CYCLE. LISTED MINIMUM FLOW INDICATES ABSOLUTE MINIMUM FLOW WHEN FLOW IS JUST BEGINNING TO BE DIRECTED THROUGH THE WATER SOFTENER TANK TO PREVENT CHANNELING AND HARDNESS LEAKAGE PAST SYSTEM.

2. 120v/1Ø POWER OUTLET REQUIRED. SEE ELECTRICAL PLANS FOR ADDED OUTLET.

GAS FIRED BOILERS

MARK	LOCATION	HEATING MBH: INPUT	OUTPUT	MIN/MAX FLOW (GPM)	WATER CONN.	GAS CONN.	NPTH	AFUE (EFFICIENCY DOE)	AFUE	WT. (LBS)	MAKE & MODEL	#OF BURNERS	REMARKS
(E) B-1	BOILER ROOM	2300	1,840	-	-	-	120/1	20"	98%	-	BRAND: CLEVELAND W WTQ		1
(E) B-2	BOILER ROOM	2300	1,840	-	-	-	120/1	20"	98%	-	BRAND: CLEVELAND W WTQ		1

1. TO UNITS TO REMAIN IN PHASE 1.

WATER TREATMENT ELEMENT

MARK	MAX FLOW (GPM)	PRESSURE DROP (PSI)	PIPE SIZE	DIMS HT x DIA	FILTRATION	CHEMICAL TREATMENT	CASING	MAKE & MODEL	REMARKS
WTE-1	84	12	2"	47" x 11"	5 MICRON MELT BOWL	GLASSP POLYPHOSPHATE	316 SS CASSETTE	ATLAS FILTERS PM7353	1

1. 6 MONTH FILTER LIFE

GAS FIRED WATER HEATERS

MARK	LOCATION	FLUE SIZE	MAX. IN	RECOVERY: GPH	°F RISE	NPTH	FALL RATE	MAKE & MODEL	REMARKS
(N) WH-1	BOILER ROOM	12"Ø	1,800	1,250	80	120/1	800	GAS FIREBOIL	1 2 3 4
(E) WH-1	BOILER ROOM	4"Ø	199	194	-	120/1	-	BRADFORD WHITE D100L199SN	

1. OWNER FURNISHED UNIT. PERMANENTLY INSTALL AS SHOWN ON PLANS. TURN OVER (E)WH MODEL FAU120 UNIT TO OWNER FOR REUSE.
2. MOUNT PER SYMBOL 1. SEE SYMBOL 1 FOR FLUE INSTALLATION.
3. PROVIDE COMBUSTION & FUNCTION WITH DELTA EFFICIENT SYSTEM BUILDING MANAGEMENT CONTROLS. SEE SEQUENCE OF OPERATION BELOW.
4. (E) UNITS TO BE REINSTALLED FOR WH-1 RELOCATION & KEPT BY OWNER AS SPARE.

PUMPS

MARK	GPM	TDH FT.	BHP	MOTOR: RPM	TYP	NPTH	WT. (LBS)	MAKE & MODEL	REMARKS
(E) DHWP-1/2	35	32	-	1725	1.75	230/1	-	BELL & GOSSETT 60-97	1
HXP-1	51	30	0.6	2475	1	230/1	45	BELL & GOSSETT 60-130	1
HXP-2	51	30	0.6	2475	1	230/1	45	BELL & GOSSETT 60-130	1
(E) BP-1/2	-	-	-	-	3	208/3	-	TACO	1

1. EQUIPTS TO REMAIN.

STORAGE TANK

MARK	GALLONS	DWV PIPING CONN. (IN)	ADAPTER FITTING: (IN)	(IN)	CASING	WT. W/ HEIGHT (LBS)	MAKE & MODEL	REMARKS
(E)DHWT-1	850	2"	60"	108"			HARDIN S/N 43600	

DOMESTIC WATER HEATING DEMAND SEQUENCE:

GENERAL

ALL NEW EQUIPMENT INSTALLED FOR THIS PROJECT SHALL BE TIED INTO THE EXISTING DELTA ENTELIGENT BMS (BUILDING MANAGEMENT SYSTEM) WITH BACNET PROTOCOL. ELIMINATE CONTROLS FOR ANY REMOVED EQUIPMENT AS APART OF THIS PROJECT & ADD CONTROLS AS INDICATED HERE. CONTRACTOR SHALL PROVIDE ALL PROGRAMMING AS REQUIRED TO MEET THE SEQUENCE OF OPERATIONS.

ALL POINTS SHALL BE MAPPED TO THE FRONT END COMPUTER CONTROLLER LOCATED IN THE BOILER ROOM TO ALLOW FULL REMOTE MONITORING AND ADJUSTMENT OF SETPOINTS. ALL CONTROLLERS SHALL COMMUNICATE WITH THE MAIN COMMUNICATION MODULES WHICH SHALL IN TURN COMMUNICATE WITH THE SYSTEM FRONT END COMPUTERS WITH REMOTE ACCESS OVER INTERNET.

BROWSER BASED CONTROLS SHALL SHOW COMPLETE & SEPARATE COLORED DIAGRAMMATIC REPRESENTATION OF EACH PIECE OF EQUIPMENT BEING CONTROLLED. DIAGRAMATIC REPRESENTATION SHALL INCLUDE THE FOLLOWING: HEAT EXCHANGER WATER HEATERS, HEAT EXCHANGER PULMPS, DOMESTIC HOT WATER TANK, GAS FIRED WATER HEATERS, GAS FIRED WATER HEATER PUMPS, BOILERS, PRIMARY & SECONDARY BOILER PUMPS SHALL EACH HAVE THEIR OWN SCREENS WITH ALL HARDWARE & SOFTWARE POINTS DISPLAYED.

CONTRACTOR SHALL PROVIDE TRENDS OF VARIOUS POINTS & CONTROL FUNCTIONS AT COMPLETION OF INSTALLATION. TRENDS SHALL SHOW THE SYSTEM OPERATION AT 5 MINUTE INTERVALS OVER SEVERAL WEEKS TO CONFIRM STABLE OPERATION OF INSTALLED EQUIPMENT. CONTRACTOR SHALL COORDINATE DIRECTLY ON-SITE WITH THE WATER BALANCING AGENT TO ASSURE THAT CONTROLS OPERATE TO ALLOW THE FLOW RATES & PERFORMANCE INDICATED ON THE PLANS.

THE INTENT OF THIS SEQUENCE IS TO ACHIEVE OPTIMUM DOMESTIC HOT WATER SYSTEM PERFORMANCE & TO MINIMIZE ENERGY COSTS. PROGRAMMED SEQUENCES THAT ARE MODIFIED AT THE EXPENSE OF HIGHER ENERGY COSTS SHALL NOT BE IMPLEMENTED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE ENGINEER.

HEAT EXCHANGER DOMESTIC WATER HEATERS

DOMESTIC CIRCULATION PUMPS HXP-1 & HXP-2 SHALL RUN CONTINUOUSLY TO MONITOR DOMESTIC HOT WATER TANK (E)DHWT-1 TEMPERATURE. DOMESTIC HOT WATER TEMPERATURE SHALL BE CONTINUOUSLY MONITORED AT DOMESTIC HOT WATER INLET TEMPERATURE SENSORS FOR HXWH-1 & HXWH-2. UPON DETECTION OF LOW (E)DHWT-1 TEMPERATURE AT 130°F (ADJ.), HXWH-1 & HXWH-2 SHALL ENABLE HEATING & CONTINUE TO HEAT (E)DHWT-1 UNTIL SETPOINT AT 145°F (ADJ.) IS ACHIEVED.

ENABLE HEATING SHALL BE COMPRISED OF THE FOLLOWING SEQUENCE:

1) HEAT EXCHANGER WATER HEATER (HXWH-1 OR HXWH-2) SHALL OPEN 2-WAY BOILER WATER VALVE. VALVE SHALL USE SIMPLE OPEN/CLOSE LOGIC WITHOUT MODULATION.
2) CALL FOR HEAT SHALL ENABLE BOILERS (B-1 & B-2) & ASSOCIATED PUMPS (BOILER PRIMARY & SECONDARY PUMPS BP-1 / BP-2 & HWP-1 / HWP-2).

GAS FIRED DOMESTIC WATER HEATER

(E)GAS FIRED WATER HEATER SHALL REMAIN ENERGIZED IN STANDBY MODE & CAPABLE OF OPERATION IF NEEDED. DOMESTIC CIRCULATION PUMPS HXP-1 & HXP-2 SHALL RUN CONTINUOUSLY TO MONITOR DOMESTIC HOT WATER TANK (E)DHWT-1 TEMPERATURE. DOMESTIC HOT WATER TEMPERATURE SHALL BE CONTINUOUSLY MONITORED AT DOMESTIC HOT WATER INLET TEMPERATURE SENSORS FOR HXWH-1 & HXWH-2. UPON DETECTION OF LOW (E)DHWT-1 TEMPERATURE AT 120°F (ADJ.) AT HXWH-1 OR HXWH-2, (E)WH-1 & (E)DHWP-1/2 SHALL ENABLE HEATING & CONTINUE TO HEAT (E)DHWT-1 UNTIL SETPOINT AT 145°F (ADJ.) IS ACHIEVED.

PLUMBING & HVAC LEGEND

SYMBOL	ABBRV.	IDENTIFICATION	ABBRV.	IDENTIFICATION
		AIR DUCT	CU	COPPER
	CW	COLD WATER (DOMESTIC)	DN	DOWN
	DWG	DOMESTIC HOT WATER	DWGS	DRAWINGS
	DHWR	DOMESTIC HOT WATER RETURN	EO	EXISTING
	HWS	(HEATING) HOT WATER SUPPLY	ESP	EXTERNAL STATIC PRESSURE
	HWR	(HEATING) HOT WATER RETURN	FLG	FLANGED
	ELL	ELBOW DOWN	FT	FEET
	TEE	TEE DOWN	GPM	GALLONS PER MINUTE
	TEE	TEE UP	HP	HORSEPOWER
		CAP	IN	INCH
	CONT	CONTINUATION	LBS	POUNDS
		BALL VALVE	MAX	MAXIMUM
		PUMP (PLAN VIEW OR DIAGRAM)	MBH	1000 BTU PER HOUR
			MECH	MECHANICAL
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER	MFR	MANUFACTURER
			MIN	MINIMUM
	SOV	SHUT-OFF VALVE (GATE)	ON	NEW
	TR/PRV	TEMPERATURE AND PRESSURE RELIEF VALVE	NC	NORMALLY CLOSED
			NO	NUMBER/NORMAL OPEN
	TDV	TRIPLE DUTY VALVE	OC	ON CENTER
			OD	OUTSIDE DIAMETER
		STRAINER	OW	OUTLET WELDED TYP
	P.O.C.	POINT OF CONNECTION	PC	PLUMBING CONTRACTOR
	°F	DEGREES FAHRENHEIT	PD	PRESSURE DROP
	FT	FEET	PH	PHASE
	FS	FLOOR SINK	PSI	POUNDS PER SQUARE INCH
			REQ'S	REQUIREMENTS
	ADJ	ADJUSTABLE	RM	ROOM
	AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	RPM	REVOLUTIONS PER MINUTE
	ARCH	ARCHITECT/ARCHITECTURAL	SQ	SQUARE
	BLDG	BUILDING	STSL	STAINLESS STEEL
	BTUH	BRITISH THERMAL UNITS PER HOUR	TEMP	TEMPERATURE
	CFM	CUBIC FEET PER MINUTE	TDH	TOTAL DYNAMIC HEAD
	CLG	CEILING	TYP	TYPICAL
	CONN	CONNECTION	V	VOLT
	CONT	CONTINUED, CONTINUATION	W/	WITH
	COORD	COORDINATE	WT	WEIGHT

MECHANICAL AND PLUMBING SPECIFICATIONS

1. SCOPE: INSTALLATION OF DOMESTIC HOT WATER HEATER ENCHANCED & BACKUP GAS FIRED DOMESTIC HOT WATER HEATER INCLUDING ALL PIPING, CONTROLS, ELECTRICAL POWER, FLUE, & BOTTOM PRESSURE. PROVIDE A COMPLETE INSTALLATION WITH FACTORY STARTUP TESTING OF ALL NEW EQUIPMENT AND CONFIRMATION OF OPERATION INCLUDING SETPOINTS AND FLOW RATES.
2. COORDINATION: COORDINATE WITH GENERAL CONTRACTOR AND ALL OTHER TRADES.
3. CODES: THE WORK SHALL CONFORM TO ALL APPLICABLE CODES LISTED ON SHEET T0.1 AND SHALL CONFORM TO NFPA AND ANSI STD.
4. DRAWINGS: DRAWINGS ARE SCHEMATIC, ALL EQUIPMENT LOCATIONS AND PIPING CONNECTIONS SHALL BE VERIFIED IN THE FIELD AND APPROVED BY THE ENGINEER.
5. CUTTING: REPAIR ALL SURFACES CUT IN THIS WORK TO MATCH ORIGINAL. NO CUTTING OF STRUCTURAL ELEMENTS IS ALLOWED WITHOUT PRIOR WRITTEN CONSENT OF THE STRUCTURAL ENGINEER.
6. MAINTAINING: ALL COMPONENT SHALL BE ACCESSIBLE FOR MAINTENANCE. PROVIDE 2 COPIES OF OEM MANUAL TO OWNER, INCLUDING PARTS LISTS, BROCHURES, ETC.
7. GUARANTEE: ALL WORKMANSHIP, EQUIPMENT AND MATERIALS SHALL BE GUARANTEED FOR ONE YEAR AFTER DATE OF ACCEPTANCE.
8. SUBMITTING: WITHIN 15 DAYS AFTER SIGNING A CONTRACT, PROVIDE SIX (6) SETS OF SUBMITTALS ON ALL EQUIPMENT AND MATERIALS.
9. MANUFACTURERS DIRECTION: INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
10. INSTALLATION: THE INTENT OF THE DRAWINGS AND THE SPECIFICATIONS IS FOR A COMPLETE WORKING INSTALLATION. CONTRACTOR SHALL PROVIDE ALL FITTING REQUIRED FOR A COMPLETE & OPERATION IN SYSTEM WHETHER NOT SHOWN ON DRAWINGS OR SPECIFIED HEREIN.
11. CONTROLS: CONTRACTOR SHALL FURNISH & INSTALL ALL CONTROLS FOR THIS EQUIPMENT. ALL CONTROL WIRING SHALL BE INSTALLED IN METALLIC CONDUIT.
12. BALANCING: CONTRACTOR SHALL BALANCE THE HYDRONIC SYSTEM TO WITHIN 10% OF THE DESIGN QUANTITIES USING BALANCING VALVES, CIRCUIT SETTERS, & TRIMPT FIRED CONTROLS. PROVIDE WATTER A REPORT OF FINAL BALANCED HYDRONIC WATER FLOWS. WRITTEN REPORT SHALL INDICATE BALANCING & MEASUREMENT EQUIPMENT USED AND DATE OF LAST CALIBRATION.
13. EXAMINATION OF SITE: THE CONTRACTOR SHALL THOROUGHLY EXAMINE SITE AND SATISFY HIMSELF AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. THE CONTRACTOR SHALL VERIFY AT THE SITE ALL MEASUREMENTS AFFECTING THIS WORK AND SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF SAME. NO EXTRA COMPENSATION WILL BE ALLOWED ON ACCOUNT OF DIFFERENCES BETWEEN ACTUAL DIMENSIONS AND THOSE INDICATED ON THE DRAWINGS.
14. MATERIALS:
   A. GAS PIPING: ALL ABOVE GROUND GAS PIPING SHALL BE STANDARD WEIGHT BLACK STEEL PIPE, SCHEDULE 40, ASTM A53 WITH BLACK MALLEABLE IRON FITTINGS.
   B. WATER & BID RECT DRAIN PIPING: HEATING HOT WATER PIPING/CONDENSATE DRAINS: HARD COPPER WATER TUBE, CONFORM TO ASTM B88 TYPE "L" ABOVE GROUND, WITH WROUGHT COPPER FITTINGS.
   C. CONDENSER DRAINS: ALL CONDENSATE PIPING FROM BOILERS SHALL BE SCHEDULE 40 CPVC WITH SOLVENT JOINTS. SLOPE AT 1/4 IN/FOOT.
   D. PIPE INSULATION: INSULATE ALL HOT WATER PIPING WITH FIBERGLASS 3.5 INCH NOMINAL THICKNESS OWENS CORNING FIBERGLAS WITH ALL PURPOSE WATER BARRIER OR EQUAL. ALL ELBOWS AND FITTINGS SHALL BE FACTORY PRE FABRICATED PVC COVERS. ON ALL EXPOSED HOT WATER DROPS, COVER INSULATION WITH PVC COVERING AND SEAL PER MANUFACTURER'S RECOMMENDATIONS.
   E. HANGERS: SHALL BE OF ONE MANUFACTURER. MASON OR EQUAL AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. INSTALLATION SHALL ALSO CONFORM TO CALIFORNIA PLUMBING CODE. SUPPORT PIPING WHERE NECESSARY, AT SUFFICIENTLY CLOSE INTERVALS TO KEEP IT IN ALIGNMENT AND TO PREVENT SAGGING.
   F. BEAMS BRACKETS AND SUPPORTS: MASON OR APPROVED EQUAL, SOLID ALL THREAD RODS AND ROD CLIPS. SUPPORTS AND BEAM CLAMPS: MASON OR APPROVED EQUAL.
   TRAPEZE HANGERS: MASON OR APPROVED EQUAL, DRAINING WATER PIPE CLAMPS AND GUIDES AS REQUIRED (INCLUDE TYPE TO BE USED IN SUBMITTALS).

PIPE SIZE	MAXIMUM SPACING IN FEET	ROD SIZE
1/2"	5	3/8"
3/4" TO 1"	6	3/8"

   G. UNIONS: PROVIDE SCREWED UNIONS OR FLANGES IN LOCATIONS REQUIRED FOR THE DISCONNECTING AND CONNECTING OF ALL EQUIPMENT, TRAPS, BYPASSES AND FOUNTAINS. MUELLER 82-307 FX COPPER PURMAL STOCKHOLM. FOR 4INS GALVANIZED MALLEABLE IRON, BRASS SEAT MUELLER, UNIONS WATER DIELECTRIC UNIONS WHERE COPPER CONNECTS TO STEEL.
   H. PIPE INSULATION: 8 FLANE, UNISTRUT, TOLCO, BEAT OR APPROVED EQUAL INSULATORS.
   I. ESCUTCHEONS: STAMPED FROM 18 GAUGE STEEL AND CHROMIUM PLATED ON PIPES PASSING THROUGH SLEEVES IN WALLS, FLOORS OR CEILINGS WHERE EXPOSED TO VIEW WITHIN A FINISHED AREA.
   J. INSTRUMENTATION:
   THERMOMETERS: ADJUSTABLE ANGLE TYPE, NUMEROPY IN GLASS, UNION CONNECTION AND BRASS SEPARABLE SOCKET. 9 IN TO 240 F RANGE, 1-DEGREE DIVISIONS. MILJOCO OR APPROVED EQUAL.
   PRESSURE GAUGES: GRADE 2A, ACCURATE WITHIN 1.0% OF SCALE RANGE, BOURDON TUBE SPRING TYPE WITH 4 1/2" DIAL WITH BLACK ON WHITE DIAL, BRASS SEAT MUELLER, UNITS WATER DIELECTRIC UNIONS WHERE COPPER CONNECTS TO STEEL.
   NEEDLE VALVE AND PRESSURE SNUBBER, AS REQUIRED. MILJOCO OR APPROVED EQUAL.
   BALL VALVES: PROVIDE NIBCO MODEL T-585-80 GEAR FREE BRONZE BODY, FULL PORT BALL VALVES FOR 1/2" THRU 2" SIZES.
   BUTTERFLY VALVES: QUARTER TURN LEVER HANDLE VALVE CONSTRUCTED OF DUCTILE IRON LUG BODY WITH ALUMINUM BRONZE DISC, NIBCO WILCON OR APPROVED EQUAL.
   FLEX CONNECTORS: BRAIDED FLEXIBLE PUMP CONNECTORS CONSTRUCTED OF 7-316L STAINLESS STEEL WITH ASA 150# FLANGES. METER BOSS, GOLD PLUS SERIES OR APPROVED EQUAL.
   CONNECTION RUBS: FLAE & ALL CONNECTIONS SHALL BE ALCHO ALLOY STAINLESS STEEL WITH FACTORY FITTINGS. SUBSTITUTE GRUFF PIMPL OR EQUAL.

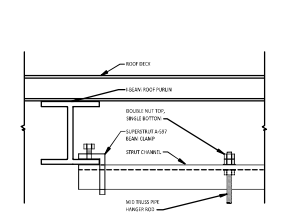
REVISIONS | DATE
PC DRAWINGS | 06/05/2023
BID REVISION | 08/11/2023

DELTA INSTITUTIONAL PLAN & ENGINEERING
No. M32543
PER ASME B31.9
MECHANICAL
DELTA INSTITUTIONAL PLAN & ENGINEERING
AXIOM engineers
BOISE | CORVALLIS | WATERFORD
NORTHLAKE | TAMPA | SIMPSONVILLE
CONCISE SOLUTIONS

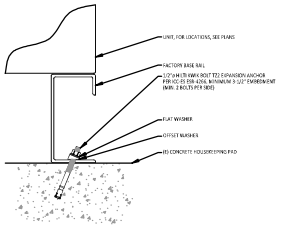
90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 1
90 ROUNTREE DRIVE
WATSONVILLE, CA 95073

LEGEND, SCHEDULES, NOTES AND SPECIFICATIONS: MECHANICAL & PLUMBING

DATE 3/1/2022
SCALE NONE
DRAWN CADD
JOB 2022.0030
SHEET MP0.1



4 PIPING SUPPORT
MP0.1 NO SCALE



1 HEAT EXCHANGER MOUNTING
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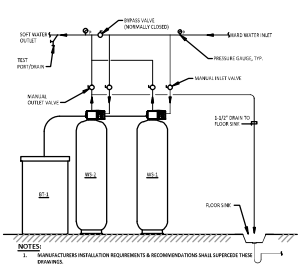
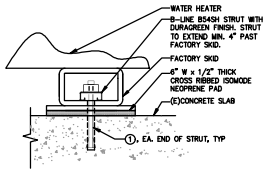


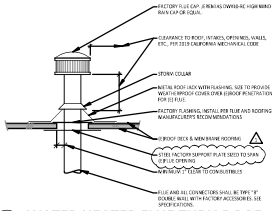
NOTES:
1. MANUFACTURERS INSTALLATION REQUIREMENTS & RECOMMENDATIONS SHALL SUPERCEDE THESE DRAWINGS.

5 WATER SOFTENER PIPING DETAIL
MP0.1 NO SCALE



NOTES:
1. 1/2" 304 STAINLESS STEEL HILTI KB-TZ2 (PER ICC-ES-ESR-4266) W/MIN. 3-1/2" EMBEDMENT. TEST TENSION LOAD = 6000 LBS.

2 WATER HEATER MOUNTING
MP0.1 NO SCALE



3 WATER HEATER FLUE THRU ROOF
MP0.1 NO SCALE

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Drawing: C:\Users\Brian\Desktop\Ken Project\20200 Johnson\Johnson Plans\MP1.0 - Roof Plan.dwg
Plot Date: 2021-12-14
Plot Time: 9:00:00 AM
Plot By: Brian Gallo

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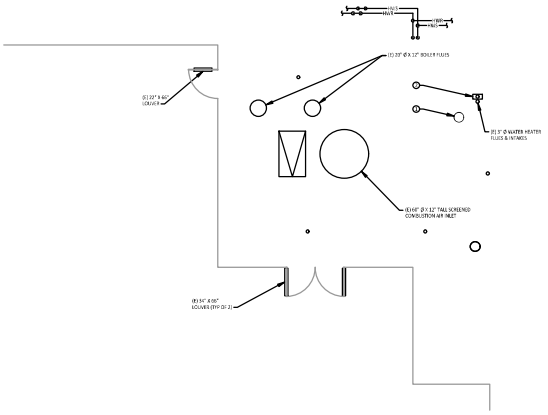
GENERAL NOTES:

1. REMOVE ALL NAMEDOWNED MATERIALS & ELEMENTS ON BOILER ROOM ROOF, PATCH & SEAL ROOF AREA PERTINENT IS ACCORDANCE WITH ROOFING MFR. REQUIREMENTS. CONFIRM REMOVAL WITH OWNER'S REPRESENTATIVE PRIOR TO REMOVAL.

SHEET NOTES:

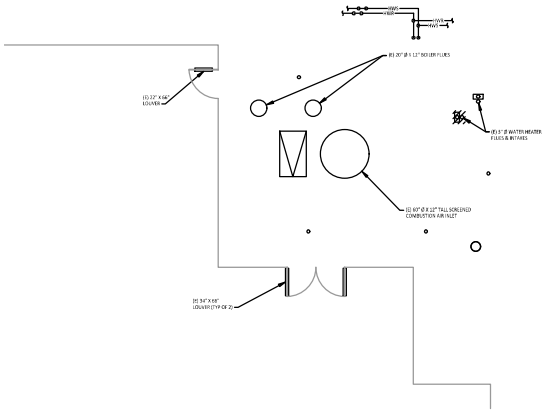
1. NEW WATER HEATER FLUE TERMINATION AT (E) OPENING FOR REMOVED FLUE. INSTALL PER SUPPL. INSTALL FLUE IN ACCORDANCE WITH WATER HEATER MFR. REQUIREMENTS & RECOMMENDATIONS.
2. CAP (E) FLUE & INTAKE WATER TIGHT. REMOVE ALL PIPING & SUPPORTS BELOW ROOF.



2 MP1.0 **PARTIAL ROOF PLAN MECHANICAL & PLUMBING - NEW**

SCALE: 1/4" = 1'-0"

NORTH



1 MP1.0 **PARTIAL ROOF PLAN MECHANICAL & PLUMBING - DEMOLITION**

SCALE: 1/4" = 1'-0"

NORTH

REVISION	DATE
BC DRAWING	06/03/2022
100 REVISION	06/11/2022

No. M33543
EXP. SEPT. 30, 2023
MECHANICAL

COLLIERS ENGINEERING + AXIOM engineering

SERVE | CONNECT | NO STONE UNTURNED
MONTEREY | SNMA | SANTA CRUZ
CBE/PE #00039008

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 1

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

ROOF PLAN - MECHANICAL & PLUMBING

DATE	3/2/2022
SCALE	1/4" = 1'-0"
DRAWN	EMBD
JOB	20210030

MP1.0

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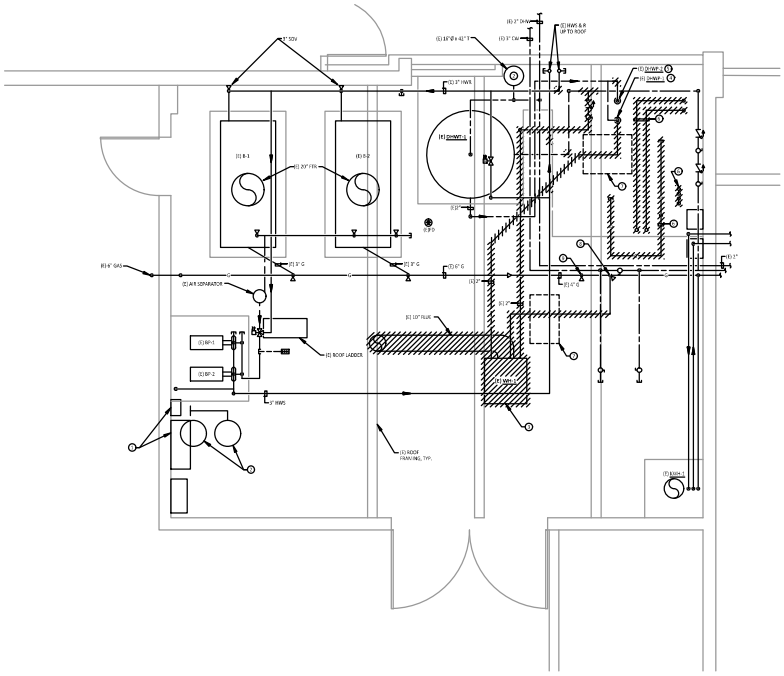
GENERAL NOTES

1. PRE-BALANCE & BALANCE REPORT: PRIOR TO STARTING WORK PROVIDE WRITTEN REPORT NOTIFYING & DOCUMENTING (B) FLOW & PRESSURE AT (1) BHP-1,BHP-2 & HOBF HEATING COILS (B.C. AIR HANDLING AS DIRECTED BY OWNER REPRESENTATIVE. FINAL BALANCE REPORT AT PROJECT CLOSEOUT SHALL INCLUDE MEASUREMENT OF SAME PARAMETERS & EQUIPMENT FOR COMPARISON.
2. (E)ROOF STRUCTURE AT APPROXIMATELY 144" ABOVE BOILER ROOM FINISHED FLOOR.
3. SEE MP4.1 FOR PIPING DIAGRAMS.
4. SEE ELECTRICAL PLANS FOR POWER TO UNITS.
5. SEE AN-P3.1 FOR PIPING SUPPORT DETAIL.

SHEET NOTES:

1. (E) MASTER CONTROL PANEL TO REMAIN.
2. (E) EXPANSION TANKS TO REMAIN.
3. REMOVE (1) 1-1/2" G & ASSOCIATED GAS PIPING, FLUE, & WATER CONNECTIONS TO (E) MP-2. TURN OVER (E) MP-1 TO OWNER AS SPARE EQUIPMENT.
4. RELOCATE (1) DHWP-1 & INSTALL NEW PIPING & ELECTRICAL AS REQUIRED.
5. REMOVE (1) DHWP-2 & ALL ASSOCIATED ELECTRICAL & PIPING. TURN OVER PUMP TO OWNER AS SPARE EQUIPMENT.
6. REMOVE (E) ABANDONED 2" GAS PIPING & 4" PVC PIPING. PROVIDE WEATHER PROOF CAP AT ANY ROOF PENETRATIONS.
7. REMOVE (E) ABANDONED MUNCHKIN WATER HEATER.
8. (E) 2-1/2" G DROP.
9. (E) 4" G DROP.


(E) 4" GAS
(E) AIR SEPARATOR
(E) BHP-1
(E) BHP-2
(E) ROOF LADDER
(E) 10" FLUE
(E) ROOF FRAMING, TYP.
(E) DHWP-1
(E) DHWP-2
(E) HWS & R UP TO ROOF
(E) 2" HWS
(E) 20" FLUE
(E) 1" G
(E) 2" G
(E) 4" G
(E) 6" G
(E) 2" G
(E) 4" G
(E) 2" G
(E) 1" G
(E) 4" G
(E) 2" HWS
(E) 2" HWS
(E) 2" DHWR
(E) 1" CW
(E) 14"W x 41" T
(E) 1" G
(E) 1" G
(E) 1" G

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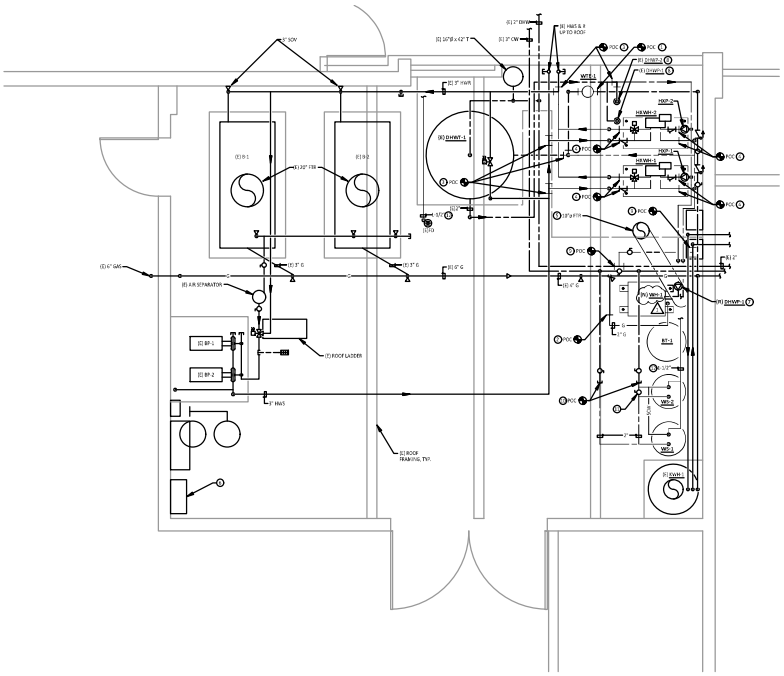
(E) 6" GAS
(E) AIR SEPARATOR
(E) BP-1
(E) BP-2
(1) ROOF LADDER
1" HWS
(E) ROOF FRAMING TYP.
(E) 10"Ø x 42'-7"
(E) 1" CW
(E) 1" DHWR
(E) HWS & R UP TO ROOF
(E) 3" HWR
(E) 2½" FW
(E) 1" G
(E) 2" G
(E) 4" G
(E) 1½" G
(E) 1½" G
(E) 1½

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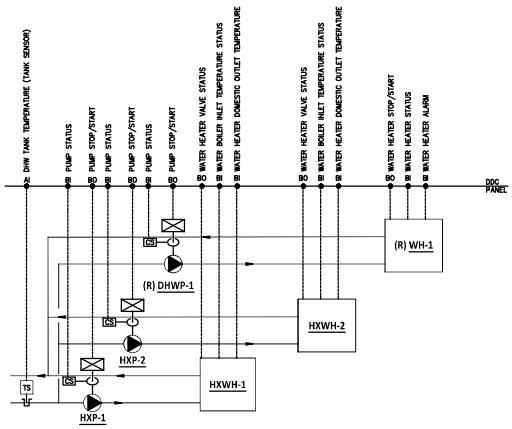


3 MP4.1 **DOMESTIC HOT WATER HEATERS & PUMP CONTROLS DIAGRAM**

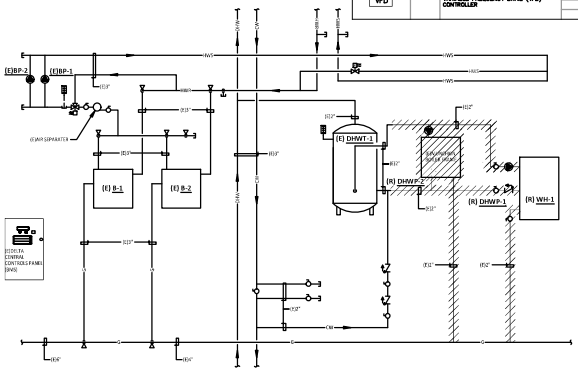
SCALE: NO SCALE

CONTROLS GENERAL NOTES

1. THIS PROJECT INCLUDES TIE-IN TO AN EXISTING DELTA CONTROLS DDC SYSTEM ON THE DETERIORA FACILITY CAMPUS (BOILER BLD). CONTRACTOR SHALL UPGRADE THE SYSTEM AS NEEDED TO ADDRESS ANY LIMITATIONS IN THE EXISTING HARDWARE (ELECTRONIC CONTROLLERS, MECHANICAL ACTUATORS, DAMPERS, VALVES, SENSORS, ETC.) AS REQUIRED TO ACHIEVE THE DESIRED SEQUENCE OF OPERATION. ANY MODIFIED UPGRADES NECESSARY TO DELIVER THE SPECIFIED CONTROLS FUNCTIONALITY THAT IS DISCOVERED AFTER BIDDING SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
2. PROVIDE OWNER WITH A WINDOWS COMPATIBLE & INSTALLABLE COPY OF THE COMPLETE CONTROLS SOFTWARE ON A COMPACT DISC (CD) AT PROJECT COMPLETION. INCLUDE ANY SPECIAL INSTRUCTIONS FOR INSTALLATION AS A SEPARATE TEXT FILE (.DOC OR .PDF FORMAT) ON THAT CD. SOFTWARE SHALL BE SUFFICIENT FOR REINSTALLATION OF THE CONTROLS SOFTWARE ON A WORKSTATION SHOULD THE EXISTING INSTALLATION BECOME COMPROMISED AND UNUSABLE.
3. ALL WIRING SHALL BE PER ELECTRICAL DRAWINGS & SPECIFICATIONS.
4. CONTROLS CONTRACTOR SHALL INSTALL SYSTEM AS DEFINED BY THESE PLANS AND THE ACCOMPANYING BOOK SPECIFICATIONS.
5. ALL ELECTRONIC MEASUREMENT MONITORING AT CONTROLS FRONT END SHALL BE COORDINATED & VERIFIED WITH THE BALANCING CONTRACTOR.

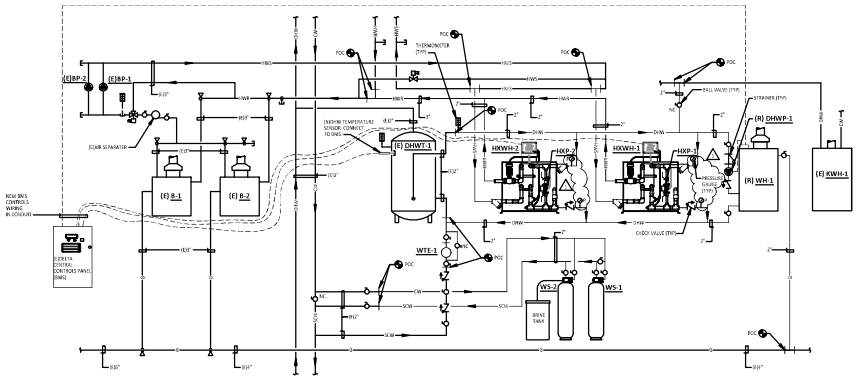
HVAC CONTROLS LEGEND

SYMBOL	ABBRV.	IDENTIFICATION	ABBRV.	IDENTIFICATION
TS	TS	TEMPERATURE SENSOR	AI	ANALOG INPUT
			AO	ANALOG OUTPUT
			ACD	AUTOMATED CONTROL DAMPER
			ADJ.	ADJUSTABLE
			ATS	AVERAGING TEMPERATURE SENSOR
TS	TS	TEMPERATURE SENSOR W/THERMOWELL	BI	BINARY INPUT
			BMS	BUILDING MANAGEMENT SYSTEM
			BO	BINARY OUTPUT
DP	DP	DIFFERENTIAL PRESSURE SENSOR	DDC	DIRECT DIGITAL CONTROLS
			DIO	DISTRIBUTED INPUT/OUTPUT MODULE
			DP	DIFFERENTIAL PRESSURE
CS	CS	CURRENT SWITCH	EA	EXHAUST AIR
			OA	OUTSIDE AIR
			RA	RETURN AIR
	ATS	AVERAGING TEMPERATURE SENSOR	VFD	VARIABLE FREQUENCY DRIVE
			TS	TEMPERATURE SENSOR
		RELAY CONTACT, NORMALLY OPEN		
VFD		VARIABLE FREQUENCY DRIVE (VFD) CONTROLLER		



1 MP4.1 **DEMO PIPING DIAGRAM - PLUMBING & MECH**

NO SCALE



2 MP4.1 **NEW PIPING DIAGRAM - PLUMBING & MECH**

NO SCALE

REVISIONS	DATE
DC DRAWINGS	06/05/2021
100% REVISION	08/11/2021

No. M32543
FOR APP. 08.30.04
STATE OF CALIFORNIA

COLE CONSULT ENGINEERING + AXIOM engineers
BOISE | CONVALLIS | MEDFORD
MONTANA | NAPA | SAN JOSE
OREGON SOLUTIONS

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 1

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

BOILER PIPING & INSTRUMENTATION DIAGRAMS

DATE	3/1/2021
SCALE	NONE
DRAWN BY	CADD
JOB	2012.0230

MP4.1

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GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS. MATERIALS AND EQUIPMENT SHALL BE UL LISTED AND LABELED FOR THE APPLICATION.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND INSPECTION FEES REQUIRED BY THE CONTRACT WORK.
3. CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO BIDDING AND ALLOW FOR ALL FIELD CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL WORK NOTED AND DETAILED OUT ON ALL CONTRACT DOCUMENTS. THE CONTRACTOR SHALL OBTAIN INFORMATION AND BE FAMILIAR WITH ALL OTHER TRADES WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION BETWEEN OTHER TRADES ON PROJECT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF PERSONS AND PROPERTY AND SHALL PROVIDE INSURANCE COVERAGE AS NECESSARY FOR LIABILITY AND PERSONAL PROPERTY DAMAGE TO FULLY PROTECT THE OWNER, ARCHITECT AND ENGINEER FROM ANY AND ALL CLAIMS RESULTING FROM THE WORK.
5. CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS AT THE PROJECT SITE INDICATING ALL MODIFICATIONS TO ELECTRICAL SYSTEMS. THE CONTRACTOR SHALL AT THE CONCLUSION OF THE PROJECT PROVIDE ACCURATE "AS-BUILT" DRAWINGS ACCEPTABLE TO THE ARCHITECT.
6. ALL MATERIALS PROVIDED TO THE PROJECT SHALL BE NEW. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL INCIDENTAL MATERIALS REQUIRED FOR A COMPLETED INSTALLATION.
7. CONTRACTOR SHALL PROVIDE TO THE OWNER A CONSTRUCTION SCHEDULE OF ELECTRICAL WORK. THE CONSTRUCTION SCHEDULE SHALL IDENTIFY ALL SIGNIFICANT MILESTONES WITH COMPLETION DATES.
8. CONTRACTOR SHALL PROVIDE ALL REQUIRED CUTTING, PATCHING, EXCAVATION, BACKFILL AND REPAIRS NECESSARY TO RESTORE DAMAGED SURFACES TO EQUAL OR BETTER THAN ORIGINAL CONDITION EXISTING AT START OF WORK.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PAINTING ALL EXPOSED CONDUITS AND ELECTRICAL EQUIPMENT. REFER TO ARCHITECT'S PAINTING SECTION FOR REQUIREMENTS.
10. ALL ELECTRICAL EQUIPMENT INSTALLED OUTDOORS SHALL BE WEATHERPROOF. EXTERIOR CONDUITS RUN INTO BUILDINGS SHALL BE INSTALLED WITH PITCHING, CAULKED AND SEALED. CONDUITS FOR EXTERIOR ELECTRICAL DEVICES SHALL BE RUN INSIDE BUILDING WALLS UNLESS OTHERWISE NOTED ON DRAWINGS.
11. ALL CONDUITS UNLESS OTHERWISE NOTED ON DRAWINGS SHALL HAVE AS A MINIMUM TWO (2) #12 WITH ONE (1) #12 GROUND. TRACE MARKS SHOWN ON DRAWINGS ARE FOR ROUGH-IN ESTIMATES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WIRES AND WIRE SIZES REQUIRED BY LATEST CODE.
12. ALL BRANCH CIRCUITS SHALL HAVE INDIVIDUAL NEUTRALS. SHARED NEUTRALS ON MULTIWIRE CIRCUITS IS NOT ALLOWED.
13. COORDINATE ALL CONDUIT RUNS, ELECTRICAL EQUIPMENT AND PANELS WITH ALL OTHER WORK TO AVOID CONFLICTS.
14. CONTRACTOR SHALL PROVIDE IN EVERY NEW EMPTY CONDUIT A DRAW STRING FOR USE IN FUTURE CONSTRUCTION.
15. ALL CONDUIT SHALL BE CONCEALED WHERE POSSIBLE. CUT AND PATCH NEATLY IN WALLS WHERE NECESSARY. WHERE IT IS NECESSARY TO CUT OR BORE EXISTING STRUCTURE, WALL OR FLOOR NEW ELECTRICAL WORK, OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO STARTING WORK. REUSE EXISTING CONDUIT WHERE POSSIBLE.
16. WHERE IT IS NOT POSSIBLE TO REUSE EXISTING CONDUIT OR RUN NEW CONCEALED CONDUIT USE NON-METALLIC SURFACE RACEWAY AND BOXES. ROUTING OF ALL NON-METALLIC RACEWAYS SHALL BE APPROVED BY THE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO ROUGHING.
17. EXTENSION RINGS OR RESET BOXES TO BE FLUSH WITH NEW WALL THICKNESS.
18. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.
19. ALL INSTALLATION OF EXPOSED SURFACE MOUNTED EXTERIOR FIXTURES, AREAS SHALL BE REVIEWED BY OWNER BEFORE ROUGHING. CONTRACTOR IS TO DETERMINE THE ACCESSIBILITY OF ATTIC, FURRED SPACE, HOLLOW WALL/BOX, ETC. IN BOX AREA AND PROVIDE WITH CHANGES IF SYSTEM CANNOT BE ROUTED CONCEALED EITHER BY CHANGE OR ACCESSIBILITY, CONTRACTOR IS TO DO SO. IF INACCESSIBILITY IS DETERMINED, CONTRACTOR SHALL INSTALL SURFACE MOUNTED RACEWAY IN THE MOST AESTHETICALLY PLEASING MEANS AS DETERMINED BY THE OWNER. NO ALLOWANCE FOR ADDITIONAL COMPENSATION DUE TO ROUTING AS DIRECTED BY THE OWNER WILL BE MADE.

ELECTRICAL SYMBOLS & ABBREVIATIONS

SYMBOLS & ABBREVIATIONS SHOWN ARE FOR GENERAL USE, DISREGARD THOSE WHICH DO NOT APPEAR ON THE PLANS.

FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
EMERGENCY ONLY LIGHT
STRIP FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
LUMINAIRE - RECESSED - SEE SCHEDULE
RECESSED WALL WASHER
LUMINAIRE - SURFACE MOUNTED - SEE SCHEDULE
LUMINAIRE - POLE OR POST MOUNTED - SEE SCHEDULE
LUMINAIRE - WALL MOUNTED SEE SCHEDULE
BOLLARD OR PATH LIGHT - SEE SCHEDULE
EXIT LIGHT - DIRECTIONAL ARROWS AS INDICATED - SEE SCHEDULE
TRACK LIGHTING - SEE SCHEDULE
EMERGENCY LIGHT
DIGITAL DUAL TECHNOLOGY OCC. SENSOR
LIGHTING CONTROL OCCUPANCY SENSOR CORNER MOUNTED
DIMMER ROOM CONTROLLER
PLUG LOAD CONTROLLER
ROOM LIGHTING CONTROLLER
LIGHTING CONTROL PANEL
DIGITAL DAYLIGHT SENSOR
SINGLE POLE SWITCH ★★
SINGLE POLE SWITCH ★★ & CIRCUIT CONTROLLED
THREE WAY SWITCH ★★
FOUR WAY SWITCH ★★
MANUAL MOTOR STARTER
KEY OPERATED SWITCH ★★
LIGHTING DIMMER ★★
DIGITAL ON/OFF SWITCH ★★
DIGITAL DIMMER SWITCH ★★
DIGITAL DUAL TECHNOLOGY LIGHTING SENSOR ★★
DIGITAL DUAL TECHNOLOGY WALL OCC. SENSOR ★★
WALL OCCUPANCY SENSOR ★★
DOUBLE SWITCHED DUAL OCCUPANCY SENSOR ★★
DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR ★★
ABUTTING DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR ★★
SECURITY DOOR CONTACTS
SECURITY MOTION DETECTOR
CCTV CAMERA
SECURITY SYSTEM KEYPAD
DOOR BELL PUSHBUTTON
DOOR CHIME WITH LED
RECEPTACLE - DUPLEX ★
DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
GFCI CONVENIENCE RECEPTACLE - DUPLEX ★
GFCI CONVENIENCE DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
RECEPTACLE DOUBLE DUPLEX ★
HALF SWITCHED DUPLEX RECEPTACLE ★
SINGLE RECEPTACLE ★
DUPLEX RECEPTACLE - CEILING MOUNTED
HC LETTER INDICATES DUPLEX HALF CONTROLLED RECEPTACLE ★
C LETTER INDICATES DUPLEX FULLY CONTROLLED RECEPTACLE ★
FLOOR MOUNTED DUPLEX RECEPTACLE
FLOOR MOUNTED BOX
POWER OUTLET - SEE PLANS FOR NEMA TYPE ★
POWER POLE
WALL TELEPHONE OUTLET ★★
VIDEO/DATA WALL OUTLET ★
VIDEO/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
SURFACE MOUNTED VIDEO/DATA WALL OUTLET ★
SURFACE MOUNTED VIDEO/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
WIRELESS ACCESS POINT (WAP) - CEILING MOUNTED
WIRELESS ACCESS POINT (WAP) - WALL MOUNTED - FIELD VERIFY HEIGHT
VIDEO/DATA OUTLET - FLOOR MOUNTED
TV OUTLET ★
VIDEO/DATA OUTLET - CEILING MOUNTED
INTERIOR SPEAKERS CEILING MOUNTED
INTERIOR SPEAKERS WALL MOUNTED
FLOOD: HALF HEIGHT LOW, VERIFY BEFORE INSTALLATION
PANELBOARD - FLUSH MOUNTED
EQUIPMENT PANEL - FLUSH MOUNTED
PANELBOARD - SURFACE MOUNTED
EQUIPMENT PANEL - SURFACE MOUNTED
METER W/ CURRENT TRANSFORMER
JUNCTION BOX - CEILING OR WALL MOUNTED. SIZE PER CODE. TAPE AND TAG WIRES
MOTOR CONNECTION
NON-FUSED DISCONNECT SWITCH
FUSED DISCONNECT SWITCH. FUSED WITH DUAL ELEMENT FUSES SIZED PER EQUIPMENT MFGR'S NAMEPLATE DATA
COMBination STARTER/FUSED DISCONNECT SWITCH. FUSED DISCONNECT SWITCH ELEMENT FUSES SIZED PER EQUIPMENT MFGR'S NAMEPLATE DATA
MAGNETIC STARTER - NEMA SIZE INDICATED NEMA 3R EXCLUSIVELY UNLESS OTHERWISE SPECIFIED
CIRCUIT BREAKER
GROUND ROD WITH GROUND WELL BOX
GROUND ELECTRODE
NORMALLY OPEN CONTACT
NORMALLY CLOSED CONTACT
TRANSFORMER - SEE SINGLE LINE FOR SIZE
PULLBOX
FLEX CONDUIT WITH CONNECTION
CONDUIT - UP
CONDUIT - DOWN
CONDUIT EMERGENCY SYSTEM
LV LOW VOLTAGE WIRING
SURFACE METAL OR NON-METALLIC RACEWAY
CONDUIT - CONCEALED IN WALLS OR CEILING
CONDUIT - EXISTING
CONDUIT - BELOW SLAB OR UNDERGROUND. SIZE ★
CAPPED OR STUBOUT CONDUIT
CONDUIT COMBination
CONDUIT - HOME RUN TO PANEL. TERMINAL CABINET, ETC., RUN MARKED WITH CROSSHATCHES INDICATE NUMBER OF #12 AND #10 WIRES WHEN MORE THAN TWO. USE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE. ORIENTATION OF WITH NUMBER ADJACENT INDICATES WIRE SIZE OTHER THAN #12 AWG.
SHEET NOTE REFERENCE SYMBOL. SEE ASSOCIATED NOTE ON SAME SHEET
SCHEDULE SYMBOL. SEE ASSOCIATED NOTE ON SAME SHEET
DETAIL NOTE REFERENCE SYMBOL. SEE ASSOCIATED NOTE ON SAME DETAIL
FS1 FEEDER DESIGNATION. SEE ASSOCIATED NOTE ON SAME DETAIL
1 / E0.0 DETAIL NUMBER. DETAIL OR SECTION REFERENCE. SHEET NUMBER
TP INDICATES QUANTITY OF TELEPHONE OUTLETS
DP INDICATES QUANTITY OF DATA OUTLETS

ABBREVIATIONS

A	AMPERE	GFCI	GROUND FAULT INTERRUPTING			NTS	NOT TO SCALE
AFF	ABOVE FINISHED FLOOR	GR	GROUND			OAH	OVERALL HEIGHT
ALUM	ALUMINUM	GRD	GROUND			OC	ON CENTER
ARCH	ARCHITECT	GRS	GALVANIZED RIGID STEEL			OH	OVERHEAD
AWG	AMERICAN WIRE GAUGE	HT	HEIGHT			PA	PUBLIC ADDRESS
BYR	BREAKER	IC	INTERCOM			PB	PULLBOX
C	CONDUIT	IDF	INTERMEDIATE DISTRIBUTION FRAME			PF	POWER FACTOR
CATV	CABLE TV					PH	PHASE
CB	CIRCUIT BREAKER	INCAND	INCANDESCENT			PIR	PASSIVE INFRARED
CCTV	CLOSED CIRCUIT TV	JB	JUNCTION BOX			PNL	PANEL
CKT	CIRCUIT	KV	KILOVOLT			PV	PHOTOVOLTAIC
CLG	CEILING	KVA	KILOVOLT AMPERES			PVC	POLYVINYL CHLORIDE
CLR	CENTER LINE	KW	KILOWATT			PWR	POWER
CUO	CONDUIT ONLY	LCP	LIGHTING CONTROL PANEL			(R)	EXISTING TO BE REMOVED
CTR	CENTER					(RR)	REMOVABLE POLE
D	DIMMER	LTG	LIGHTING			RECPTS	RECEPTACLES
DIM	DIMMER	LV	LOW VOLTAGE			REQD	REQUIRED
DIST	DISTRIBUTION	KCM	THOUSAND CIRCULAR MILS			REQMTS	REQUIREMENTS
(E)	EXISTING					SCT	SCHEDULE
EC	ELECTRICAL CONTRACTOR	MCB	MAIN CIRCUIT BREAKER			SD	SINGLE LINE DIAGRAM
(EL)	EMERGENCY LIGHT	MCA	MINIMUM CIRCUIT AMPACITY			STG	SYSTEM GROUNDING TERMINATION
EM	EMERGENCY	MDF	MAIN DISTRIBUTION FRAME			SW	SWITCH
EMT	ELECTRICAL METALLIC TUBING	MECH	MECHANICAL			SWBD	SWITCHBOARD
EQUIP	EQUIPMENT	MH	METAL HALIDE			TTB	TELEPHONE TERMINAL BOARD
EV	ELECTRICAL VEHICLE	MLO	MAIN LUGS ONLY			TYP	TYPICAL
EWC	EXTERIOR WALL CONDUIT	MPDE	MAIN POINT OF ENTRANCE			UON	UNLESS OTHERWISE NOTED
FACP	FIRE ALARM CONTROL PANEL	MTG	MOUNTING			UG	UNDERGROUND
FC	FOOT CANDLE	MVCP	MAXIMUM OVER CURRENT PROTECTION			V	VOLT
FH	FINISH	(N)	NEW			VD	VOLTAGE DROP
FL	FLOOR	NEC	NATIONAL ELECTRICAL CODE			W	WATT
FLA	FULL LOAD AMPS	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION			WP	WATERPROOF
FLOOR	FLOOR	NL	NIGHT LIGHT			XFMR	TRANSFORMER
(F)	FUTURE	NO	NORMALLY OPEN				
GC	GENERAL CONTRACTOR	NC	NORMALLY CLOSED				

FIRE ALARM

NOTE: SEE THE FIRE ALARM DRAWINGS FOR QUANTITIES AND MOUNTING HEIGHTS.

MANUAL PULL STATION
STROBE ONLY
HORN ONLY
MH HORN
HORN/STROBE
CHIME/STROBE
HEAT DETECTOR
SMOKE DETECTOR
CARBON MONOXIDE ALARM
DUCT SMOKE DETECTOR
TAMPER SWITCH
FLOW SWITCH
POST INDICATING VALVE
FIRE SMOKE DAMPER
BELL (SOUND)
FACP FIRE ALARM CONTROL PANEL
APS AUXILIARY POWER SUPPLY
FSA FIRE SYSTEM ANNUNCIATOR
FTS FIRE ALARM TRANSPONDER OR TRANSMITTER
EPS ELEVATOR STATUS SPECIAL
FAC FIRE ALARM COMMUNICATOR
RTU REMOTE ANNUNCIATORS
EOL END OF LINE

★=15" AFF, TO BOTTOM OF BOX. U.O.N.
★★=48" AFF, TO TOP OF BOX. U.O.N.
(#) NUMBER IN BRACKETS DENOTES NUMBER OF CABLE DROPS WHEN MORE THAN (2)

APPLICABLE CODES & STANDARDS

CODES:

1. 2019 CALIFORNIA ADMINISTRATIVE CODE (CCR, TITLE 24, PART 1).
2. 2019 CALIFORNIA BUILDING CODE (CBC) (CCR, TITLE 24, VOL. 1 & 2 BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC) WITH CALIFORNIA AMENDMENTS).
3. 2019 CALIFORNIA ELECTRICAL CODE (CEC) (CCR, TITLE 24, PART 3 BASED ON IT HE 2017 NATIONAL ELECTRICAL CODE (NEC) WITH CALIFORNIA AMENDMENTS).
4. 2019 CALIFORNIA MECHANICAL CODE (CMC) (CCR, TITLE 24, PART 4 BASED ON THE 2018 UNIFORM MECHANICAL CODE (UMC) WITH CALIFORNIA AMENDMENTS).
5. 2019 CALIFORNIA PLUMBING CODE (CPC) (CCR, TITLE 24, PART 5 BASED ON THE 2018 UNIFORM PLUMBING CODE (UPC) WITH CALIFORNIA AMENDMENTS).
6. 2019 CALIFORNIA ENERGY CODE (CCR, TITLE 24, PART 6).
7. 2019 CALIFORNIA FIRE CODE (CFC) (CCR, TITLE 24, PART 9 BASED ON THE 2018 INTERNATIONAL FIRE CODE (IFC) WITH CALIFORNIA AMENDMENTS).
8. 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE (CCR, TITLE 24, PART 11).
9. 2019 CALIFORNIA REFERENCED STANDARDS CODE (CCR, TITLE 24, PART 12).
10. TITLE 19 (CCR), PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.
11. NATIONAL FIRE ALARM CODE (NFPA 72) 2016.
12. COUNTY OF SANTA CRUZ ORDINANCES, CODES, AND REGULATIONS.

STANDARDS:

1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
2. ELECTRONIC INDUSTRIES ASSOCIATION (EIA).
3. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE).
4. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA).
5. NATIONAL ELECTRICAL TESTING ASSOCIATION (NETA).
6. UNDERWRITER LABORATORIES (UL).
7. CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ACT STANDARDS (CALOSHA).

SHEET INDEX

E0.1 SYMBOLS, ABBREVIATIONS, CODES, STANDARDS, NOTES & SHEET INDEX.
E1.1 ELECTRICAL SERVICE UNDERGROUND & PANELBOARD SCHEDULES.
E2.1 OVERALL SITE PLAN.
E3.1 ELECTRICAL DEMOLITION & POWER PLAN.
E4.1 ELECTRICAL SPECIFICATIONS.

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REVISIONS	DATE
50% IFP	09/30/21

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 1
SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE CA 95073

SYMBOLS, ABBREVIATIONS, DEMOLITION NOTES, CODES, STANDARDS & SHEET INDEX

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PANELBOARD SCHEDULES

(E) PANEL EP

Voltage	208/120V, 3Ø
Wire	4W
MBP	1600A
Mounting	Surface
Mains	1600A

Circuit	Load	A	B	C	Bkr.	Ckt.	Ckt.	Bkr.	A	B	C	Load	Circuit
EP-1/3		400		400	15/3	1	2	15/3	400		400		EP-2/4
EP-5/7			400	400		3	4			400	400		EP-6/8
EP-9	800					5	6						
EP-11		400		400	15/3	7	8	15/3	400		400		EP-12
EP-13			400	400		9	10			400	400		EP-14
EP-15						11	12						
EUHF-1 (EF/UB)	1200					13	14		500				SUHF-4 (EF/UB)
EUHF-2 (EF/UB)		400		400	15/3	15	16	15/3		400	400		SUHF-5 (EF/UB)
EUHF-3 (EF/UB)			400	400		17	18						
EUHF-6 (EF/UB)	800					19	20		500				SUHF-1 (EF/UB)
EUHF-7 (EF/UB)		400		400	15/3	21	22	15/3		400	400		SUHF-2 (EF/UB)
EUHF-8 (EF/UB)			400	400		23	24						
EUHF-1 (SUPPLY)	1500				20/3	25	26	20/3	500				SUHF-4 (SUPPLY)
EUHF-2 (SUPPLY)		1500		1500		27	28			500	500		SUHF-5 (SUPPLY)
EUHF-3 (SUPPLY)			1500	1500		29	30						
EUHF-6 (SUPPLY)	2000				40/3	31	32	40/3	1500				SUHF-1 (SUPPLY)
EUHF-7 (SUPPLY)		2000		2000		33	34			1500	1500		SUHF-2 (SUPPLY)
EUHF-8 (SUPPLY)			2000	2000		35	36						
SUHF PROTECTOR					40/3	37	38	40/3	2000				MUHF (SUP)
SUHF PROTECTOR						39	40			2000	2000		MUHF (EF/UB)
SUHF PROTECTOR						41	42						MUHF (UP)
	5500	5500	5500						5500	5500	5500		

Est. Phase A	91.7 A	Total Connected Load (VA)	95.4
Est. Phase B	91.7 A	Total Demand Load (VA)	95.4
Est. Phase C	91.7 A		

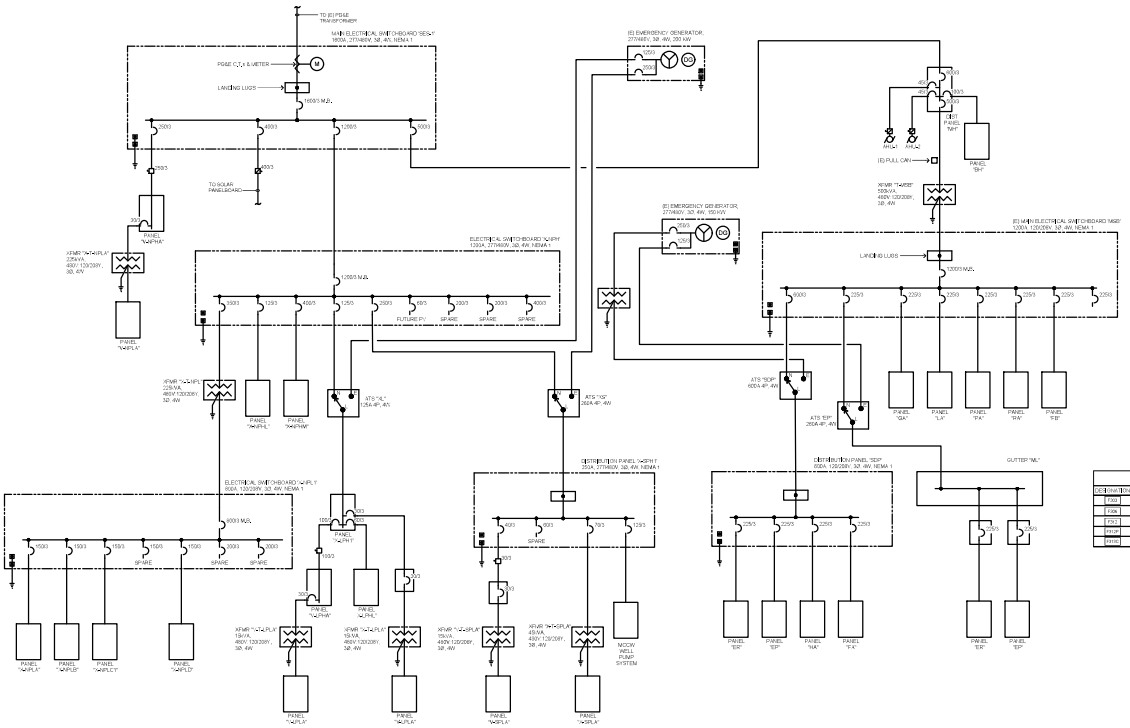
(E) PANEL ER

Voltage	208/120V, 3Ø
Wire	4W
MBP	1600A
Mounting	Surface
Mains	1600A

Circuit	Load	A	B	C	Bkr.	Ckt.	Ckt.	Bkr.	A	B	C	Load	Circuit
ER-1	500				20/1	1	2	20/1	1000				ER-2
ER-3		500			20/1	3	4	20/1		1000			ER-4
ER-5			1000		20/1	5	6	20/1			1000		ER-6
ER-7	500				20/1	7	8	20/1	1000				ER-8
ER-9		500			20/1	9	10	20/1		1000			ER-10
ER-11			1000		20/1	11	12	20/1			1000		ER-12
ER-13	1000				20/1	13	14	20/1	750				EP-1
HB-2		1000			20/1	15	16	20/1		750		1400	EP-3
HB-2			1000		20/1	17	18	20/1			750		EP-5
HB-3	1000				20/1	19	20	20/1	1000				ENGINEERED PUMP
HB-3		1000			20/1	21	22	20/1		1000			ENGINEERED PUMP
HB-3			1000		20/1	23	24	20/1			1000		ENGINEERED PUMP
EP-7	1400				20/3	25	26	20/3	1500				EP-9
EP-9		1400				27	28			1500			EP-11
EP-11			1400			29	30				1500		EP-13
CONTROL CHB-1 (VAND)					20/1	31	32	20/1	750				EP-15
WATER		2700				33	34			750		1400	EP-17
WATER			2700		40/3	35	36	40/3			2700		EP-19
WATER	2700					37	38		2700				EP-21
WATER					20/1	39	40	20/1					EP-23
SPARE						41	42						SPARE
	10200	10200	8100						9100	9100	8000		

1. CONTACT HVAC CIRCUIT TO FOLLOW BRANCH
2. REALIGN EXISTING BRANCH AS AS INSTALL NEW BRANCHES
3. PROVIDE + TYPED PANELBOARD DIRECTORY

Est. Phase A	95.7 A	Total Connected Load (VA)	95.7
Est. Phase B	95.7 A	Total Demand Load (VA)	95.7
Est. Phase C	95.7 A		



SINGLE LINE DIAGRAM LEGEND

	(E) NEW
	(E) EXISTING
	(NEW)
	(E) FLOOR MOUNTED EQUIPMENT
	(N) FLOOR MOUNTED EQUIPMENT

FEEDER SCHEDULE

DESIGNATION	AMPACITY	CONDUIT & CONDUCTOR SIZES
F-3/6	75	1 3/4" C., 3 #1 & 1 #6 GND.
F-3/6	150	1 1/2" C., 3 #1/0 & 1 #6 GND.
F-7/1	400	3 1/2" C., 3 #350kcmil & 1 #2 GND.
F-7/2	400	12 SETS OF 2" C., EACH W/ 4 #350 & 1 #2 GND (PARALLEL).
F-7/3	600	20 (10 1 1/2" C., EACH W/ NEW 3 #350kcmil & 1 #1/0 GND (PARALLEL).

1 SINGLE LINE DIAGRAM - FOR REFERENCE ONLY
NO SCALE

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REVISIONS	DATE
0 ISSUED	10/30/20

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ELECTRICAL ENGINEER
STATE OF CALIFORNIA

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 1

SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95076

ELECTRICAL SINGLE LINE DIAGRAM & PANELBOARD SCHEDULES

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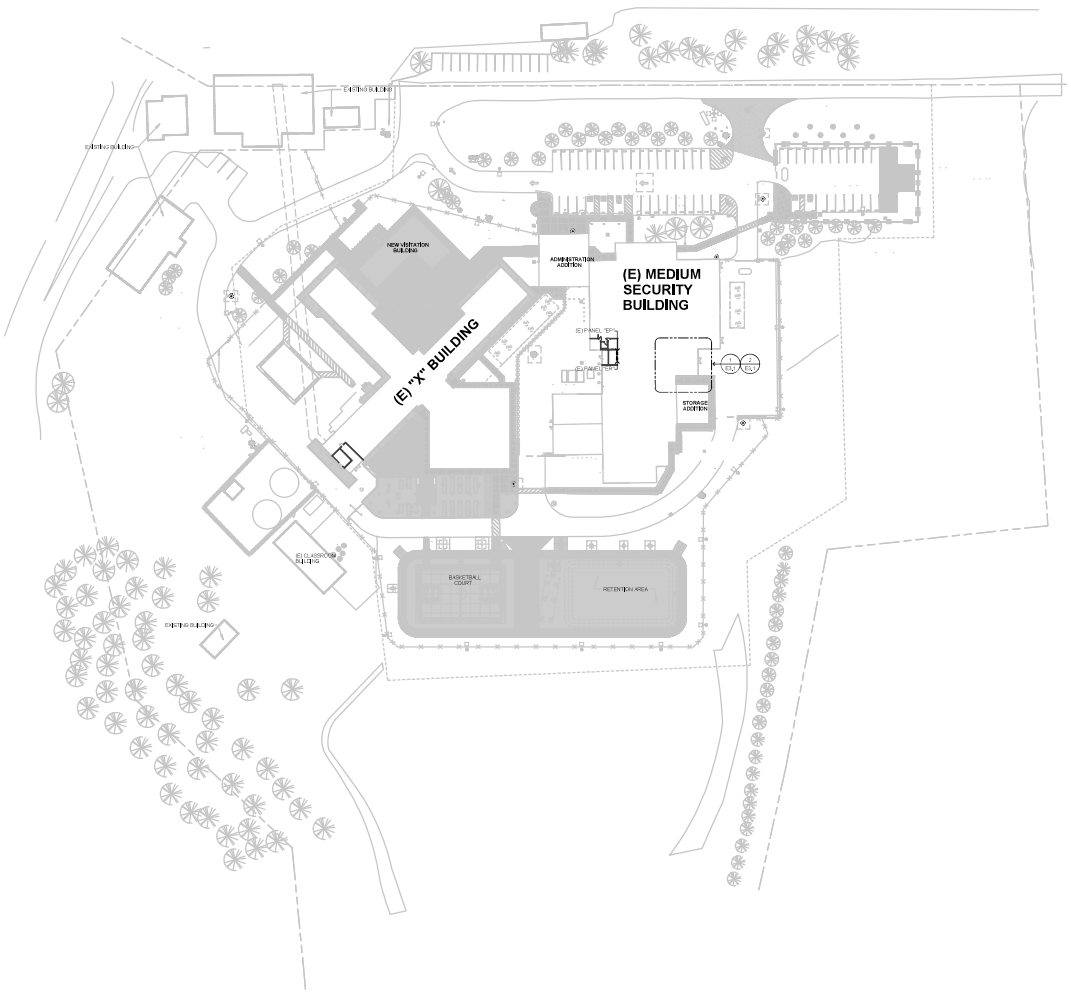

GENERAL DEMOLITION NOTES

A. CONTRACTOR SHALL FIELD VERIFY EXTENT OF ELECTRICAL DEMOLITION AND QUANTITIES OF ELECTRICAL TO BE REMOVED AS DICTATED BY THE REQUIREMENTS OF THE PROJECT.

B. REMOVAL SHALL INCLUDE WIRING, RACEWAY, BOXES, SWITCHES, LIGHT FIXTURES, ETC. AS INDICATED ON THE PLANS AND AS REQUIRED BY THESE DEMOLITION NOTES.

C. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE CONCEALED IN EXISTING REMAINING WALLS MAY BE ABANDONED IN PLACE, REMOVE WIRING FROM CONDUIT.

D. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE EXPOSED SHALL BE REMOVED.

E. WHERE REMOVAL OF EQUIPMENT OR WIRING IS INDICATED, IT SHALL INCLUDE ALL ASSOCIATED WIRING BACK TO LAST ACTIVE REMAINING OUTLET, DEVICE, FIXTURE OR PANEL.

F. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL REMAINING ACTIVE CIRCUITS, DEVICES, OUTLETS, LIGHT FIXTURES, ETC. HAVE NOT BEEN DISCONNECTED OR MADE INOPERATIVE DURING DEMOLITION. ELECTRICAL CONTRACTOR SHALL RESTORE ALL INTERRUPTED OR DISCONNECTED CIRCUITS TO OPERATION.

G. ELECTRICAL CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL REMOVED ELECTRICAL EQUIPMENT AND MATERIAL.

H. NO REMOVED EQUIPMENT OR MATERIAL SHALL BE REUSED AS PART OF NEW WORK. (U.O.N.)

I. EXISTING REMAINING CONCEALED RACEWAY SHALL BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK.

J. EXISTING FLUSH OUTLETS MAY BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK, MEET THE REQUIREMENTS OF THE CURRENT T.C.L.C. FOR VOLUME AND COMPLY WITH LOCATION SHOWN FOR THE NEW WORK.

K. FLUSH OUTLET BOXES IN EXISTING WALLS TO REMAIN MAY BE ABANDONED IN PLACE, REMOVE DEVICES AND WIRING, PLUG OPENING AND PROVIDE AND INSTALL A BLANK DEVICE PLATE.

L. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.

M. WHERE TELEPHONE, COMPUTER DATA, FIBER OPTICS, FIRE ALARM OR OTHER COMMUNICATIONS OUTLETS OR WIRING IS TO BE DEMOLISHED IT SHALL BE REMOVED BACK TO THE NEXT TERMINAL POINT. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER OR OWNER'S REPRESENTATIVE TO HAVE EQUIPMENT AND WIRING DEMONSTRATED FOR REMOVAL OR PRESERVATION PRIOR TO REMOVAL OF OUTLET BOXES. CONDUCT WORKING BY ELECTRICAL CONTRACTOR.

N. COORDINATE WITH OWNER PRIOR TO START OF DEMOLITION TO WITHHOLD POWER INTERRUPTIONS. WORK MAY HAVE TO OCCUR DURING NON-REGULAR BUSINESS HOURS. COORDINATED WITH WITH OWNER ONE WEEK PRIOR TO PLANNED POWER INTERRUPTIONS.

SCALE: 1"=40'-0"

NORTH

AURIUM CONSULTING ENGINEERING MONTEREY BAY INC.

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90 ROUNTREE LANE
WATSONVILLE, CA 95076

OVERALL SITE PLAN

DATE	7/14/2022
DRAWN BY	CSED
JOB #	20200930
SHEET	E2.1

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SHEET NOTES

1. CONTRACTOR SHALL DISCONNECT W/ 120V CONNECTION TO FACILITATE RELOCATION OF TANK.
2. DISCONNECT AND SALVAGE BRANCH CIRCUIT FOR PHASE 2.
3. CONNECT TO EXISTING BREAKER(S).
4. 120V, 3Ø EXISTING GAS FIRED BOILER.
5. 1.75HP, 208V, 3Ø EXISTING PUMP.
6. 1HP, 208V, 3Ø EXISTING PUMP.
7. 120V, 3Ø EXISTING GAS FIRED WATER HEATER.
8. 120V WATER HEATER CONTROL CIRCUIT.
9. 1HP, 208V, 3Ø PUMP.

GENERAL DEMOLITION NOTES

A. CONTRACTOR SHALL FIELD VERIFY EXTENT OF ELECTRICAL DEMOLITION AND QUANTITIES OF ELECTRICAL TO BE REMOVED AND ACTUATED BY THE REQUIREMENTS OF THE PROJECT.

B. REMOVAL SHALL INCLUDE WIRES, RACEWAY, BOXES, SWITCHES, LIGHT FIXTURES, ETC. AS INDICATED ON THE PLANS AND AS REQUIRED BY THESE DEMOLITION NOTES.

C. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE CONCEALED IN EXISTING REMAINING WALLS MAY BE ABANDONED IN PLACE, REMOVE WIRING FROM CONDUIT.

D. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE EXPOSED SHALL BE REMOVED.

E. WHERE REMOVAL OF EQUIPMENT OR WIRING IS INDICATED, IT SHALL INCLUDE ALL ASSOCIATED WIRING BACK TO LAST ACTIVE REMAINING OUTLET, DEVICE, FIXTURE OR PANEL.

F. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL REMAINING ACTIVE CIRCUITS, DEVICES, OUTLETS, LIGHT FIXTURES, ETC. HAVE NOT BEEN DISCONNECTED ON A TEMPORARY BASIS DURING DEMOLITION. ELECTRICAL CONTRACTOR SHALL RESTORE ALL INTERRUPTED OR DISCONNECTED CIRCUITS TO OPERATION.

G. ELECTRICAL CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL REMOVED ELECTRICAL EQUIPMENT AND MATERIAL.

H. NO REMOVED EQUIPMENT OR MATERIAL SHALL BE REUSED AS PART OF NEW WORK, U.O.N.

I. EXISTING REMAINING CONCEALED RACEWAY SHALL BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK.

J. EXISTING FLUSH OUTLETS MAY BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK, MEET THE REQUIREMENTS OF THE CURRENT CALCODE VOLUME AND COMPLY WITH LOCATIONS SHOWN FOR THE NEW WORK.

K. FLUSH OUTLET BOXES IN EXISTING WALLS TO REMAIN MAY BE ABANDONED IN PLACE, REMOVE DEVICES AND WIRING, PLUG OPENING AND PROVIDE AND INSTALL A BLANK DEVICE PLATE.

L. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.

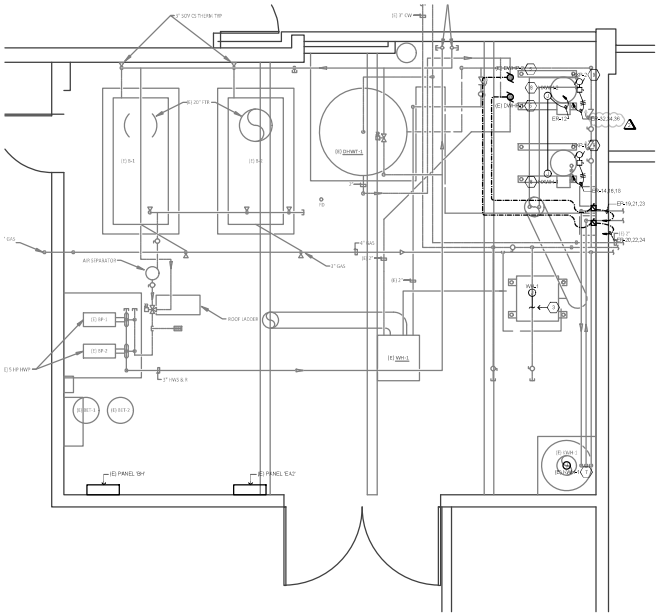
M. WHERE TELEPHONE, COMPUTER DATA, FIBER OPTICS, FIRE ALARM OR OTHER COMMUNICATIONS OUTLETS OR WIRING IS TO BE DEMOLISHED IT SHALL BE REMOVED BACK TO THE NEAR TERMINAL POINT. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER OR OWNERS REPRESENTATIVE TO HAVE EQUIPMENT AND WIRING DESIGNATED FOR REMOVAL OR PRESERVATION PRIOR TO REMOVAL OF OUTLET BOXES. COORDINATE WIRING BY ELECTRICAL CONTRACTOR.

N. COORDINATE WITH OWNER PRIOR TO START OF DEMOLITION TO WITHHOLD POWER INTERRUPTIONS. WORK MAY HAVE TO OCCUR DURING NON-REGULAR BUSINESS HOURS. COORDINATE WORKING WITH OWNER ONE WEEK PRIOR TO PLANNED POWER INTERRUPTIONS.

BRANCH CIRCUIT CONDUCTOR SIZING TABLE

PANEL	CIRCUIT NUMBER	CIRCUIT LENGTH	REQUIREMENT
2B120	6&8P	30' C.	2#10 & 1#10 GND.
2B120	9&11P	30' C.	2#6 & 1#10 GND.
2B277	13&15P	30' C.	2#10 & 1#10 GND.
2B277	20&22P	30' C.	2#6 & 1#10 GND.

NOTE:
CONTRACTOR SHALL USE BRANCH CIRCUIT CONDUCTORS PER THE TABLE ABOVE AS DETERMINED BY THE CIRCUIT CONDUCTOR LENGTH. LOCAL CONTRACTOR SHALL SIZE TO BID AND WITH INTERMEDIATE BOX FOR DEVICE CONNECTION IF NECESSARY.


(E) 2" SOV C3 THERM TYP
(E) 3" CW
(E) 20" TTR
(E) 5-1
(E) 5-2
(E) DHWT-1
(E) DHWT-2
(E) 2" HTW
(E) 2" CW
(E) 2" HW
(E) 2" HW
(E) 2" H

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SECTION 26 05 73

GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 Description of Work
A. Provide and install all required equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 Submittals
A. As specified in Division 1. Submit to the architect shop drawings, manufacturer's data and catalog cuts, including complete specifications, ratings, dimensions, weights, and other pertinent information to be submitted including manufacturer's descriptive literature of and signed products, equipment, drawings, diagrams, performance and characteristic curves as applicable; test data and catalog cuts. Obtain written approval before purchase, fabrication, or delivery of the items to the job site.
B. Substitutions of products will not be reviewed or approved prior to awarding of the Contract.
C. Substitutions shall be proven to the architect or Engineer to be equal or superior to the specified product. Architect decides if that. The Contractor shall pay all costs incurred by the architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.
D. If a proposed substitution is accepted, the contractor shall furnish the specified product at no increase in contract price.
E. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are needed of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultant.

1.03 Quality assurance
A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions of the following applicable codes:
1. California Electrical Code (CEC)
2. Occupational Safety and Health Act (OSHA) standards.
3. Underwriters Laboratories (UL) standards.
4. Electrical Contractor shall possess a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of the contract and be maintained throughout the duration of the contract.
B. Variances: In instances where less or more codes are at variance, the most restrictive requirement shall govern.
C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers association (NEMA).
D. Underwriters Laboratories (UL) listing is required for all equipment and materials where such listing is in effect for the type of equipment or material.
E. Electrical equipment shall be listed and labeled by a nationally recognized testing laboratory (NRTL) where such labels.
F. The electrical contractor shall guarantee all work and material installed under this contract for a period of one (1) year from date of acceptance by owner.
G. All tools and materials covered by the specifications shall be subject to inspection at any and all times by representatives of the Owner, Engineer, Inspector of Record, Architect and Contractor and approved by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises, if not corrected but been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.04 Contract Documents
A. Drawings: The Electrical Drawings shall generally be general layout of the completed construction. Work shall be installed in accordance with the overall structural and mechanical plans and approximate unless dimensioned, and by location with the Architect prior to installation.
2. The general arrangement and locations of existing conduits, piping, apparatus, etc. are approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions and coordination with other trades. Contractor shall be responsible for the proper fitting of his work to accommodate such. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the drawings due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.
3. Work not specifically shown or specified shall be considered as whole. The contractor shall report any apparent discrepancies to the Architect prior to submitting bids.
4. The contractor shall be fully responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be fully responsible for knowledge of all existing conditions affecting work and no allowance for ignorance of such conditions shall be made for any extra expense due to failure to make such examination.

1.05 Contract Submittals
A. Manuals: Provide manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 1.

1.06 Coordination
A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.
B. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of the work.
C. Where connections must be made to existing installations, properly schedule all the required work, including the prior shutdown periods.
D. When two trades join together in an area, make certain that no electrical work is omitted.

1.07 Job Conditions
A. Operations: Perform all work in compliance with Division 1.
1. Keep the conduct and duration of power shutdowns periods to a minimum.
2. Schedule all power shutdowns with the Owner's representative. Prepare a detailed schedule 3 months and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities.
3. Carry out shutdowns only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule at 3 days prior to the shutdown.
B. Coordination of Work: In addition to the requirements of the other specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power from the owner's on site source. Energy costs shall be paid for by the Owner.

1.08 Safety and Indemnity
A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement and application continuously and not be limited to normal working hours. The contractor shall provide and maintain all safety devices, shoring, barricades, temporary guardrails, temporary lighting, temporary fencing, warning lights, etc. to prevent accidental injury to people or damage to property.
B. The Contractor performing work under the Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damages arising out of or alleged to arise out of the performance of the work described herein or under the Division of the Specifications, and caused in whole or in part by the negligence of the contractor, anyone directly or indirectly employed by the contractor or anyone for whose acts the contractor may be liable, regardless of or even if such claim is caused in part by a party indemnified hereunder. Such indemnification does not include, however, the sole or active negligence of the Owner, the Engineer, their consultants, officers, agents and employees.
C. If work zone is encountered that contains hazardous materials, the contractor is advised to coordinate with the owner and its consultants concerning the abatement of hazardous material by the Owner's Representative. "Hazardous material" means any toxic substance regulated or controlled by OSHA, EPA, State of California or local rules, regulations and laws. Nothing herein shall be construed or interpreted to require the Contractor to perform duties regarding hazardous materials abatement, removal, or discovery of hazardous materials.

1.09 Air Flush
A. The contractor shall install a dirty trouble air flush manifold to the outside door of all penthouse and industrial control panels, as well as to the front of all switchboards and motor control centers that are part of this project.
B. The manifold shall have the following marking: line 1 "WARNING" (in large letters), line 2 "DIRTY AIR FLUSH" (in large letters), line 3 "Wear Appropriate Personal Protective Equipment and Tools required when working on this equipment."

1.10 All boxes and enclosures for emergency circuits shall be permanently marked with a steady visible red, spray painted mark.

PART 2 – PRODUCTS

2.01 Nameplates
A. Identify each piece of equipment and related controls with engraved laminated engraved plastic nameplates. Unless otherwise noted, nameplates shall be minimum plastic 0.125 inch thick white with black matte core. Radius shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where no attention specified, lettering shall be minimum of 0.25 inch high normal block style. Engrave nameplates with the designations indicated on the Drawings and, if not indicated, with the equipment name. Identify Relays and plates to plug using free standing steel or brass screws.

2.02 Finish requirements
A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory to the satisfaction of the Architect
B. Wiring Devices: In finished areas, panel off, exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 – EXECUTION

3.01 Workmanship
A. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the "NECA's Standard Practices For Good Workmanship in Electrical Contracting". Workmanship of the entire job shall be first class in every respect.

3.02 Equipment Installation
A. Provide the required mounts, bolts and anchors, and securely attach all equipment and materials to these supports.
B. Cut and patch the ceiling and patching necessary for the proper installation work and repair any damage done.
C. Earthquake restraints: all electrical equipment, including conduits over 1 inch in diameter, shall be braced to withstand the horizontal and vertical earthquake forces as required per CBC Section 1616A, Title 24, part 2 and ASCE/SEI, sections 13.1 and 13.4 and table 13.5-1.
D. Structural work: All core drilling, hole anchor insertion, or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of any construction. All floor slabs and structural concrete walls to be drilled, cut or hole anchors inserted shall be X-ray scanned. Contractor shall be responsible to pay for the services of the structural engineer, or geotechnical. Submit sketch showing location of the and proposed cuts, carts, or hole anchor locations for approval.

3.03 Field Tests
A. Test all new equipment field devices and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate suitable for service.
B. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for Machine service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

3.04 Records
A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" conditions. After completion of the work, the Contractor shall carefully enter the work in actually constructed, revising, deleting and adding to the Drawing Sheets as required. As-built Drawings shall be delivered to the architect within two (10) days of completion of construction.

3.05 Clean Up
A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Architect.

3.06 Mechanical and Plumbing Electrical Work
A. Provide all electrical work for the mechanical and plumbing equipment as specified and/or as indicated under this Contract shall be coordinated and verified with the following:
1. Mechanical and Plumbing Drawings
2. Mechanical and Plumbing sections of these Specifications.
3. Manufacturers of the Mechanical and Plumbing equipment supplied.
B. The Electrical Contractor shall be responsible for the proper location, size, location and type of disconnect, control, and connecting required. Any changes that are required as a result of this coordination and verification shall be at part of this Contract.
C. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:
1. Motor starters complete and wiring.
2. Disconnect switches.
3. Manual line motor starters.
D. All line voltage control wiring for Mechanical and Plumbing equipment shall be installed in conduit. Providing, installation and connection of all low voltage conduit, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.

SECTION 26 05 28

GROUNDING

PART 2 – EXECUTION

2.1 Grounding and Bonding
A. Grounding and bonding shall be as required by codes and local authorities.
B. All electrical equipment shall be grounded, including, but not limited to, panel boards, terminal cabinets and outlet boxes.
C. The ground path of receptacles shall be connected to their outlet boxes by means of a copper ground conductor in addition to the conduit system.
D. A green insulated copper ground wire, sized to simply code rules, shall be installed in all conduit runs.
E. All metal parts of pull boxes shall be grounded per code requirements.
F. All ground conductors shall be green insulated copper.

SECTION 26 05 42

CONDUITS, RACEWAYS AND FITTINGS

PART 2 – EXECUTION

2.01 Conduit, Raceway and Fitting Installation
A. Put conduit runs exposed to weather protects rigid metal (GRS).
B. Put conduit run underground, or concrete or masonry block wall and water concrete slabs, metal aluminum 'X' size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground or under slab to above grade (exposed) wrapped rigid metal (GRS) elbows and covers shall be used for the last 10 feet of the run. Provide PVC coated rigid metal conduit (RMC) elbows and covers for the last 10 feet of the run.
C. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.
D. Conduit runs in concrete floors shall be 1" inch unless noted otherwise on the Drawings.
E. Installation shall comply with the CEC.
F. Non-pull point rigid pull point, the sum of the angles of all of the bends and offset shall not exceed 360 degrees.
H. Conduit Supports: Provide support all conduits as required by the NEC. Run all conduits exposed except where otherwise shown on the drawings.
1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and on exposed runs according NEC requirements, wherever possible, group conduits together and support on trapeze hangers. Use individual hangers for single runs of conduit. Do not support conduits from the suspended ceiling, or walls demands. The conduit system with provide clearance.
A. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.
B. Group exposed conduits together. Arrange such conduits uniformly and neatly.
C. Provide a minimum of 1 inch clearance between conduits and the surface of the structure.
D. Support conduit runs in shafts with Material Department, or approved equal. Unistrut and straps.
E. Wall Sleeves: Provide in accordance with NEC paragraphs 250.42 and 300.5(g).
F. Where PVC conduit transitions from underground to above grade, provide rigid steel 90's with cover. Rigid steel shall be bolted-up wrapped with 20 mil tape and extend minimum 12" above grade and shall be coated with a bituminous material.
G. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.
H. Slips of underground raceways to provide drainage, for example, slope conduit from equipment to manhole or building to the pull box or conduit to manhole or building.
I. Conduits shall be blown out and mandrelled prior to pulling wires.

SECTION 26 05 43

LOW VOLTAGE WIRE AND CABLE

PART 2 – PRODUCTS

2.01 Conductors
A. Conductors shall be copper, type THHN/THWN/THW-2 oil and gasoline resistant, 90°C, 600 volt rated insulation.
B. Conductors shall be stranded copper.
C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.
D. All conductors used on this Project shall be of the same type and conductor material.

2.02 Terminations
A. Miscellaneous – Terminals: as manufactured by T&B, Burndy or equal.
B. Wire Terminations – Stranded conductors shall be terminated to a compression type termination which serves to contain all the strands of the conductor. Crimping of a stranded conductor around a cover terminal is not acceptable. Crimping of a solid conductor around a cover terminal is acceptable as the stranded conductor. Use only a stainless steel approved for the field terminals selected.
C. Bell Seals – Wire shall plastic caps of proper size for the wire in which used.

2.03 Tape
A. Tape used for terminations and cable sealing shall be compatible with the conductors and jacket of the cable and shall be of plastic material.

PART 3 – EXECUTION

3.01 Cable Installation
A. Clean Raceways – Clean all raceways prior to installation of cables as specified in Section 26 05 42 – Conduits, Raceway and Fittings.
B. Pull all conductors to be installed in raceway shall be installed in conduit, 12 AWG.
C. All feeder conductors shall be continuous from equipment to equipment. Splices in feeders are not permitted unless specifically stated or approved by the Electrical Engineer.
D. All branch circuit wiring shall be concealed in ceiling spaces, walls, below floors or in concealed spaces unless noted otherwise.

3.02 Cable Terminations and Splices
A. Splices – UL Listed materials.
B. Terminations – Use only one of the following:
1. Burndy or equal. Use solid and stranded conductors to minimize cable stress and stress on device being terminated on.
2. Thermal welds: Use conductor prior to inserting in cable breaking compound filled crimnal.

3.03 Circuit and Conductor Identification
A. Color Coding: Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. Conductor colors shall be as follows:

VOLTAGE	PHASE	CONDUCTOR
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

B. Color coding shall be the conductor insulation for all conductors #10 AWG and smaller, for larger conductors, color tape available as the insulation or colored plastic tape applied at every location where the conductor is easily accessible.
C. Circuit Identification – All underground distribution and service circuits shall be provided with plastic coded identification tags or with metallic tags and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) served by the circuit.

3.04 Field Tests
A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall be in proper operating condition when completed and shall operate satisfactorily for the requirements of the CEC. All circuits shall be tested for proper neutral connections.
B. Insulation Resistance Tests: perform insulation resistance tests on circuits with #1 AWG and larger conductors to be energized with a low-voltage (1.25 volts or more) ohmmeter. Make these tests before all equipment has been connected. Test the insulation with a 500 Vdc insulation resistance tester. Minimum reading 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.
C. Contractor shall repair all terminations of broken/chipped terminations when required per CEC and manufacturer labeling requirements at point of connection.

SECTION 26 05 53

OUTLET, JUNCTION AND PULL BOXES

PART 2 – PRODUCTS

2.01 Outlet boxes, Junction and Pull boxes
A. Standard Outlet Boxes: Galvanized steel, hot-dipped type of size and configuration best suited to the purpose and conditions of use. Boxes shall be minimum 4 inch square and 1.5 inch deep, unless noted high fixtures for NEC and local codes. Boxes shall be large enough to accommodate the number of conductors required and in no case shall be smaller than standard boxes.
B. Switch boxes: Minimum size shall be 4 inches square by 2.125 inches deep with stud straps as required. Install analog if switches in standard gang boxes with raised device covers suitable for the intended use.
C. Conduit bodies: Galvanized steel, malleable iron. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be used to facilitate pulling of conductors or to make changes in conduit directions only. Tight covers are permitted in conduit bodies. Crouse-Hinds Form 8 Condulets, Appleton Form 35 Unilets or equal.
D. Pull boxes: Provide pull boxes of the size and configuration shown or as required, whichever are larger, to meet the requirements of the NEC. Pull boxes shall be Code compliant with covers secured by stainless steel machine screws located on sides or centers. Circle AYR Products, Hoffman Engineering Company or equal.
E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping covers with flush bead cover retaining screws, screw control.

PART 3 – EXECUTION

3.01 Outlet Boxes
A. Outlet Boxes:
1. All outlet boxes shall flush flush with building walls, ceilings and floors except in mechanical and electrical rooms above accessible ceiling or where required much is called for on the Drawings.
2. Install metal device covers (plastic only) on all switch and receptacle outlet boxes installed in masonry or steel walls or in fixed, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.
3. Leave no unused openings in any box. Install closures plugs as required to seal openings.
B. Junction Boxes:
1. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments in locations as required by structural conditions and to suit coordination requirements of other trades.
2. Locate switch outlet boxes on the latch side of doorways.
3. Install junction boxes in accessible locations in the building. Do not install junction boxes in concealed spaces or in a manner not shall be supported horizontally by at least one steel or metal structural member.
4. For outlet mounted above counters, but close or backsplashes, coordinate location and mounting heights with the owner. Adjust mounting height to agree with required locations for equipment.
5. On fire rated walls, the total free area of the outlet boxes shall not exceed 100 square inches per 100 square feet of wall area.
C. Supports:
1. Outlet Boxes installed in metal stud wall shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Flatten outlet boxes installed in suspended ceiling of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to stone ceiling runners. Provide channel bars of sufficient length to span at least two ceiling runners. Channel bars shall be supported directly from the structure above where practical. Channel lighting fixtures are to be installed on the bar.
3. Flatten Boxes above dry ceilings having exposed suspension systems shall be supported directly from the structure above.
4. Flatten Boxes in plaster ceilings shall not be supported by grid or flatten hanger wires at any location.

3.02 Junction and Pull Boxes
A. General
1. Provide junction or pull boxes where required to back bends or conduit runs in excess than 100 degrees or where pulling tension calculated would exceed the manufacturer allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.
2. Locate pull boxes as indicated on the Drawings or as required to minimize stress on cable(s) or exposed to electrical noise, utility noises or storage areas.
3. Install pull boxes in ceiling of gypsum board or lath and plaster or flatten; suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.
4. Leave no unused openings in any box. Install closures plugs as required to seal openings.
5. Identify on cover and number and panel on cover of junction box with black marker pen.
B. Box Location
1. Install junction box ceilings having exposed suspension systems shall be located adjacent to openings for removable recessed lighting fixtures.
C. Supports
1. Flatten outlet boxes installed in metal stud wall shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Flatten outlet boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to stone ceiling runners.
3. Flatten outlet boxes in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above.
4. Flatten mounted above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

SECTION 26 27 24

DAY NIGHT WIRING

PART 1 – PRODUCTS

1.01 Receptacles
A. General – Receptacles shall be heavy duty, high abuse, gleaming type
B. Duplex Receptacles
1. Receptacles shall be specification grade, rated 20 amperes, nominally 125V, 1.75 watts, NEMA 5-20R, 2 pole, 3 wire, grounding with screw terminals. Color shall be as selected by the Architect.
2. Devices shall have nylon face, back and side wired.
3. Provide Hubbell #5352 Series, Leviton #5352 Series
C. GFCI Receptacles
1. Devices shall be rated 20 amperes, 125Vac, 60Hz, 1.75 watts, conforming to NEMA 5-20R configuration. Face shall be nylon composition. Unit shall have an LED type red indicator light, test and reset push buttons. Color shall be as selected by the Architect.
2. Provide ground fault circuit interrupter receptacles with a trip level of 4.1 MA (rated at 7 milliamperes current imbalance). Operating range shall extend from 4.0 TO 6.1 MA. Unit shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.
3. Manufacturer: Hubbell #GFCI_, Leviton #7599 Series.

1.02 Switches
A. Switches shall be rated 20 amperes at 120/277 Volts ac. Units shall be flush mounted, toggle operating, quiet operating single pole device. Handle color shall be as selected by the architect.
1. Manufacturer: Hubbell #HBL1221_, Leviton #1221 Series.
B. Dimmer Switches: Provide dimmer switches with a rating of 600W for Wall Dimmer Switch rated for the voltage specified on drawings. Units are shall be adjustable from 5 minutes up to 12 hours. Unit shall be provided with warning alarm.

1.03 Plates
A. General – Plates shall be of the style and color to match the wiring device, and of the required number of gangs. Plates shall conform with NEMA WD-1, UL 514 and FS W-P-455b. Plates on finished walls shall be nonmetallic or stainless steel. Plates on unfinished walls and on fittings shall be of the same material as the fitting to which they are attached, unless otherwise noted.
B. Nonmetallic: Plates shall be gang-only formed edges and shall be radius or mitered. Roughing Stainless Steel: Plates shall be .040 inches thick with beveled edges and shall be manufactured from Type 430 alloy having a brushed or satin finish.
D. Cast Metal: Plates shall be cast or malleable iron covers with gaskets to serve in corners recessed in masonry or concrete walls.
E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction

PART 2 – EXECUTION

2.01 Installation of Wiring Devices
A. Interior Locations: In finished walls, install each device in a flush mounted box with sections as required to hang the device matching along vertical faces of the finished wall. On unfinished walls, surface mount boxes level and plumb.
B. Install each device in a flush mounted box in the wall that will not be farther back from the finished wall plane than 1/4 inch; adjust boxes as that they do not project beyond the finished wall. Height of device shall be as follows:
1. Switches shall be 48 inches from finished floor to bottom of their actuator
otherwise noted on the Drawings.
2. Toggle Switches 48 inches from finished floor to top of their
C. Receptacles
1. Ground each receptacle using a grounding conductor, not a wire or screw contact.
2. Connect receptacles in a manner that will not break the branch circuit wiring in such a way that removal of this receptacle will not disconnect continuity and branch circuit power will not be lost to other receptacles in the same circuit.

2.02 Installation of Wall Plates
A. Install wall plates to match the style of the device and shall be plastic unless 1/2 inch of the vertical is horizontal.
B. Interior Locations, Finished Walls: Install nonmetallic plates so that all floor edges are continuous contact with the finished wall surface. Plaster filling will not be permitted. Do not use recessed plates or recessed plates.
C. Interior Locations, Unfinished Walls: Install stainless steel or cast metal cover plates.
D. Exterior Locations: Install cast metal plates with gaskets on wiring devices on each exterior wall to provide a rain tight weatherproof installation. Cover Type shall match box type. Cover shall be Lockwood outdoor weatherproof "cover" type.
E. Future Locations: Install blank cover plates on all unused outlets.
F. Provide a minimum of two (2) spare circuits in the panel for future use. Indicate the spare circuits on the panelboard and circuit number serving that device. Lettering shall be 1/8" minimum high, black color, on clear Mylar tape.

2.03 Trim
A. Receptacles
1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral condition.

SECTION 26 28 16

CIRCUIT BREAKERS

PART 1 – PRODUCTS

1.01 Circuit Breaker: Each circuit breaker shall consist of the following
A. A molded case breaker with an over center toggle mechanism, providing non-locking quick-break action. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic tripping elements, a trip indicator, and a trip bar to ensure simultaneous single-pole tripping which will not rely on single adjustment to ensure uniform tripping characteristics on each pole. Circuit breakers shall be of the bolted type unless otherwise noted. Circuit breakers shall be rated for continuous operation at 100% of NEC.
B. Each circuit breaker shall have an accessory to handle protection and shall be tripped.
C. Three pole breakers shall be common trip.
D. The circuit breakers shall be constructed to accommodate the supply connection at either end of the circuit breaker. Circuit breaker shall be suitable for mounting and operation in any position without derating or affecting the trip characteristics.
E. Circuit breakers and the Panelboard breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations for use in the end use equipment in which it is installed. Any series rated combination used shall be marked on the end use equipment per CEC section 110-9.
H. Circuit breakers, Bolted. Circuit breakers shall have reversible lugs.
I. Lugs shall be UL listed for copper and aluminum conductors.
J. Breakers shall be UL listed for installations of functions all screw type lugs.
K. Circuit breakers serving HACR rated loads shall be HACR type. Circuit breakers serving other motor loads shall be motor rated.
L. Breakers installed in Panelboards, GFCI, shall be of the overbolted type, Square D Spectrum, Westinghouse Cutler-Hammer, or FPE Stratum only.

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REVISIONS	DATE
REVISION	DESCRIPTION

90 ROUNTREE FACILITY
BOILERS & DHW REPLACEMENT - PHASE 1
SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95076

ELECTRICAL SPECIFICATIONS

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